MOTOR AGE

Vol. XXXII
No. 17

CHICAGO, OCTOBER 25, 1917

Ten cents a copy
Three dollars a year

Note How Hudson Dealers Prosper

Hudson Dealers make money. Wherever Hudsons are sold, the Hudson Dealer dominates. He is the leader in his community.

He is envied, and often referred to by his less successful competitors as "lucky." It is not "luck," however, but sound and sane merchandising that has made these years of big profits possible.

In any city, note the prestige Hudson Dealers enjoy. Invariably they have the finest showrooms—the best locations.

Hudson Dealers are executives, and not just automobile salesmen. Their standing is unquestioned. They have the ability to plan, look into the future, and grow with Hudson.

Since last year over 40,000 Super-Sixes have been sold. Think what this means to Hudson Dealers.

Wouldn't you like to be a Hudson Dealer and share in these profits? If you think that you measure up to the Hudson standard, write us. It may be to our mutual advantage.

HUDSON MOTOR CAR COMPANY

Detroit, Michigan

There Are Great Opportunities for Men Who Sell Hudsons

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Advertisers' Index—Next to Last Page

In This Issue—Why Insurance Rates Are Higher

JOHNSON'S
FREEZE-PROOF
COSTS LESS THAN ALCOHOL
BETTER THAN ALCOHOL
LASTS ALL WINTER

Economical and Easy

Johnson's Freeze-Proof is the most economical anti-freeze compound on the market. It is very easy to use—simply dissolve in water and pour into the radiator. One package is sufficient to protect a Ford to 5° below zero; for large cars use two packages to protect to 5° below zero, and three packages to protect to 25° below zero.

Use one application of JOHNSON'S FREEZE-PROOF this winter—then forget there is such a thing as a frozen radiator. Leave your radiator uncovered on the coldest day—leave your car at night in an unheated garage—IT CAN'T FREEZE.

Does Not Evaporate or Steam

Alcohol evaporates with the water. JOHNSON'S FREEZE-PROOF does not.

Alcohol must be instantly replenished to offset evaporation. One application of JOHNSON'S FREEZE-PROOF is sufficient for the whole winter. Alcohol is dangerous—its fumes as well as its high inflammability. JOHNSON'S FREEZE-PROOF is non-inflammable, absolutely harmless.

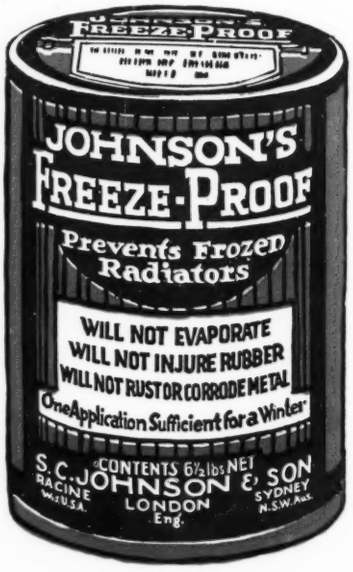
JOHNSON'S FREEZE-PROOF raises the boiling point of water from 212° to from 225° to 250°, depending upon amount used. Chances of overheating are reduced correspondingly.

Protect Your Radiator NOW

Insist upon your dealer supplying you with Johnson's Freeze-Proof. His jobber has it. Johnson's Freeze-Proof is put up in packages containing 6½ lbs. net which retail at $1.50 each in U.S.A.

If your dealer cannot supply you, we will fill orders direct by prepaid Parcel Post to points in U. S. A. East of the Rockies. Use the Coupon. Write for our folder on "Keeping Your Car Young" —it's Free.

S. C. JOHNSON & SON
Dept. MA RACINE, WIS.



USE THIS COUPON

S. C. JOHNSON & SON, Dept. MA, Racine, Wis:

I enclose $1.50 for which please send me prepaid one 6½-lb. package of Johnson's Freeze-Proof.

NAME .....

ADDRESS .....

CITY AND STATE.....

MY DEALER IS.....

.....

.....

MOTOR AGE

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NEXT WEEK

The articles on the new U. S. A. heavy-duty war trucks, published in this and last week's issues, will culminate in MOTOR AGE'S annual truck issue, in which the truck industry as a whole, as well as the war truck, will be treated. Next week MOTOR AGE will contain complete specifications of trucks, together with a complete synopsis of the truck industry and its wonderful growth during 1917.

Give a "Worth While" Look to your place of Business

Black & Decker LECTROFLATER

ELECTRIC AIR COMPRESSOR

Air Service Station DeLuxe

The cheapest and best advertisement you can buy.

Inflates 10 tires at a cost of one cent.

A No. 2 Lectroflater, the most efficient and economical electric air pump of its size built, is installed in the upper compartment. This is kept locked.

Will inflate a 34 x 4 tire from flat to full pressure in 90 seconds. Requires no attention. Always on the job. Grease (not oil) lubricated. Scientifically air cooled. No water to freeze in Winter. Pumps only cool, clean, dry air.

A large accurate pressure gauge with illuminated dial is set in the door. This gauge shows pressure in tire before, during and after inflation.

The lower compartment contains a long hose and an electric starting switch.

The top has a 16-inch opalescent globe equipped with a 75-watt nitrogen lamp.

WRITE today for booklet "A Friendly Touch" for full information about the Lectroflater Line of Electric air compressors. Prices range from $50.00 up.

The Black & Decker Mfg. Co.

111 Pratt Street, Baltimore, Md., U. S. A.

Distributors in Canada *The Northern Electric Co.*, Montreal

HAVING THE STAMINA FOR WAR

AMERICAN machinery, American railroads, American trucks will be put to as drastic a test as the man power of the nation. Their ability to accomplish and to endure will be a factor in winning the war. Production will rise to unheard-of levels—and men will be scarce. The war will absorb them. If more work is to be done, with fewer hands, *machinery will have to do it.*

In transportation, motor trucks will displace horse draft, to save drivers. For the same reason, larger, better, more efficient trucks will take the place of lighter and cheaper ones. Heavier loads, faster time, uninterrupted service will demand it.

Every operation must be adjusted to save men. They will be scarce and expensive. The truck which can do the most work and keep at it the longest is the best investment. The essential thing is performance—doing the work—handling the volume—at low cost.

Every experienced truck user knows what a mechanical strain truck service imposes under ordinary conditions. Rough going, heavy loading, overspeeding, careless driving—all have their effect. Only the best mechanism survives.

Under war conditions high pressure work will intensify the strain. Only the highest grade trucks will be able to work uninterruptedly.

Never before have the manufacturing standards always so rigidly maintained in building White Trucks appeared so vital. In normal service it takes time to demonstrate the low operating cost and high performance of a White Truck. Under the stress of wartime traffic they show up quickly. It takes White stamina to perform and endure.

THE WHITE COMPANY, *Cleveland*

When Writing to Advertisers, Please Mention Motor Age

Vol. XXXII, No. 17 Chicago, October 25, 1917 $3.00 per Year

MOTOR AGE

Capital Receives War Trucks

President Wilson inspects the U. S. A. war truck at Washington and discusses it with H. L. Horning

WASHINGTON, Oct. 19—The war truck has been formally adopted for the Government by Secretary of War Baker, who himself drove one of them along Pennsylvania avenue in front of the White House. The first two heavy-duty war trucks which the Quartermaster's Department, assisted by the automotive products section of the Council of National Defense and the Society of Automotive Engineers, designed, were officially delivered to, and accepted by, the Secretary to-day in the presence of the highest representatives of the nation.

The arrival of one of the trucks, that assembled at Rochester, N. Y., marked the completion of a journey replete with Liberty Loan and recruiting enthusiasm, heightened by parades held in the various towns and cities along the route. Newspapers and the mayors of cities visited were notified in advance of the truck's early arrival and many towns met the truck en masse and paraded through the business centers. Harrisburg, the capital of Pennsylvania, had a parade that extended throughout the city, so great was the enthusiasm. When the pilot car reached Munsey, Pa., some time before the truck did, it found the whole town turned out to see the great war truck. Other cities were similarly enthusiastic.

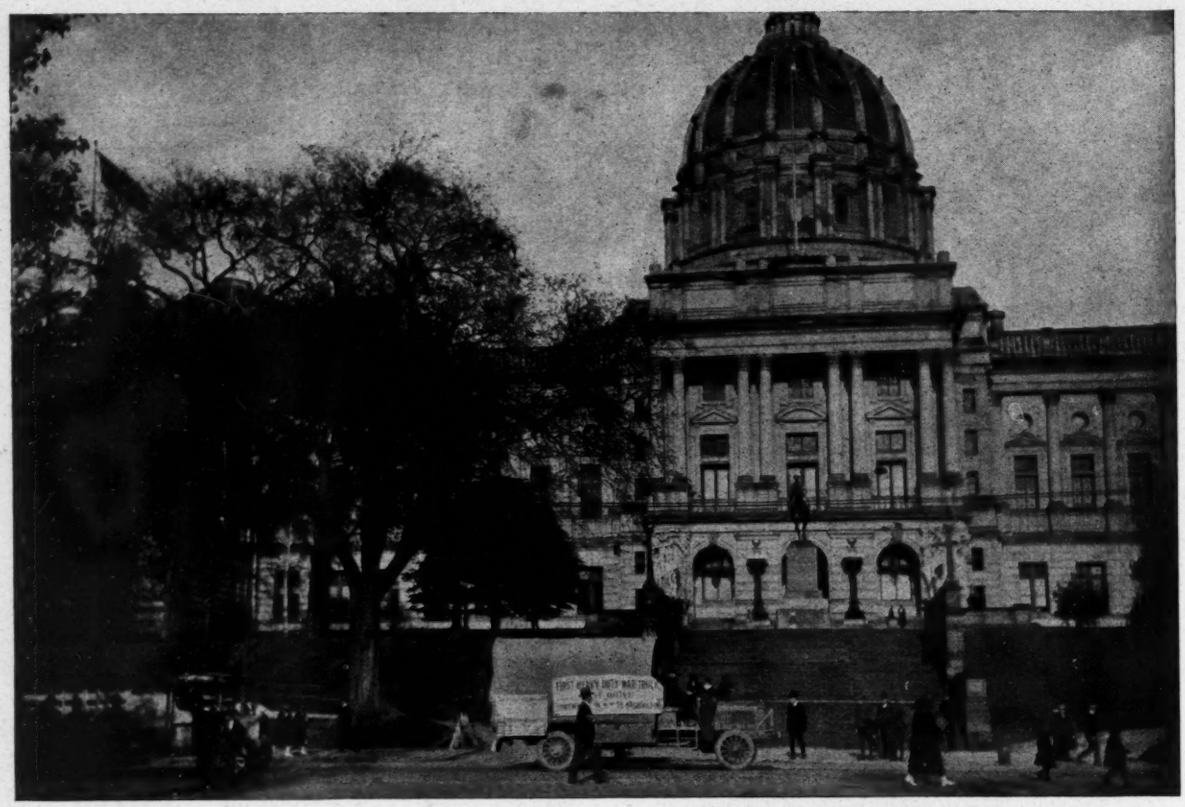
An Interesting Journey

The journey itself was particularly interesting. Much of the driving was done at night over roads strange to the drivers, and the exceptionally bright lights of the truck, combined with an unusual horn, served as a veritable Paul Revere cry to draw the rural residents from their homes to gaze on this the miracle of modern warfare. There were no mishaps. The truck never faltered in its travels over the inclines and steep grades of the Allegheny mountains, and low speed was not used at any time during the entire journey.

Each of the two factories at which the trucks were assembled is more than 450 miles from the capital, and in each case the runs were made without trouble, notwithstanding wet mountain road conditions. The trucks were not pushed unduly, it being considered that prolonged night driving introduced more risk than the short time gained warranted.

President Wilson and members of the Cabinet viewed the trucks late in the day, after they were brought to the White House park. Formal ceremonies marked the acceptance of the trucks, in which A. W. Copeland, chairman of the production schedule committee for the experimental trucks; General Chauncey B. Baker and Secretary of War Baker took part.

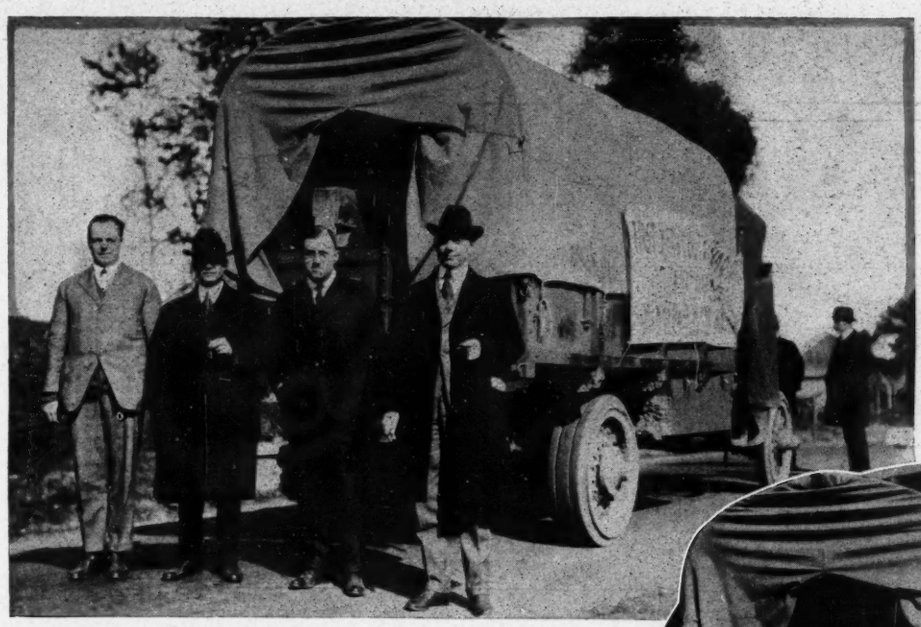
"We promised to design the Class B heavy-duty war trucks and build two samples by Oct. 10," said Mr. Copeland. "These two sample trucks were completed two days ahead of schedule, one being



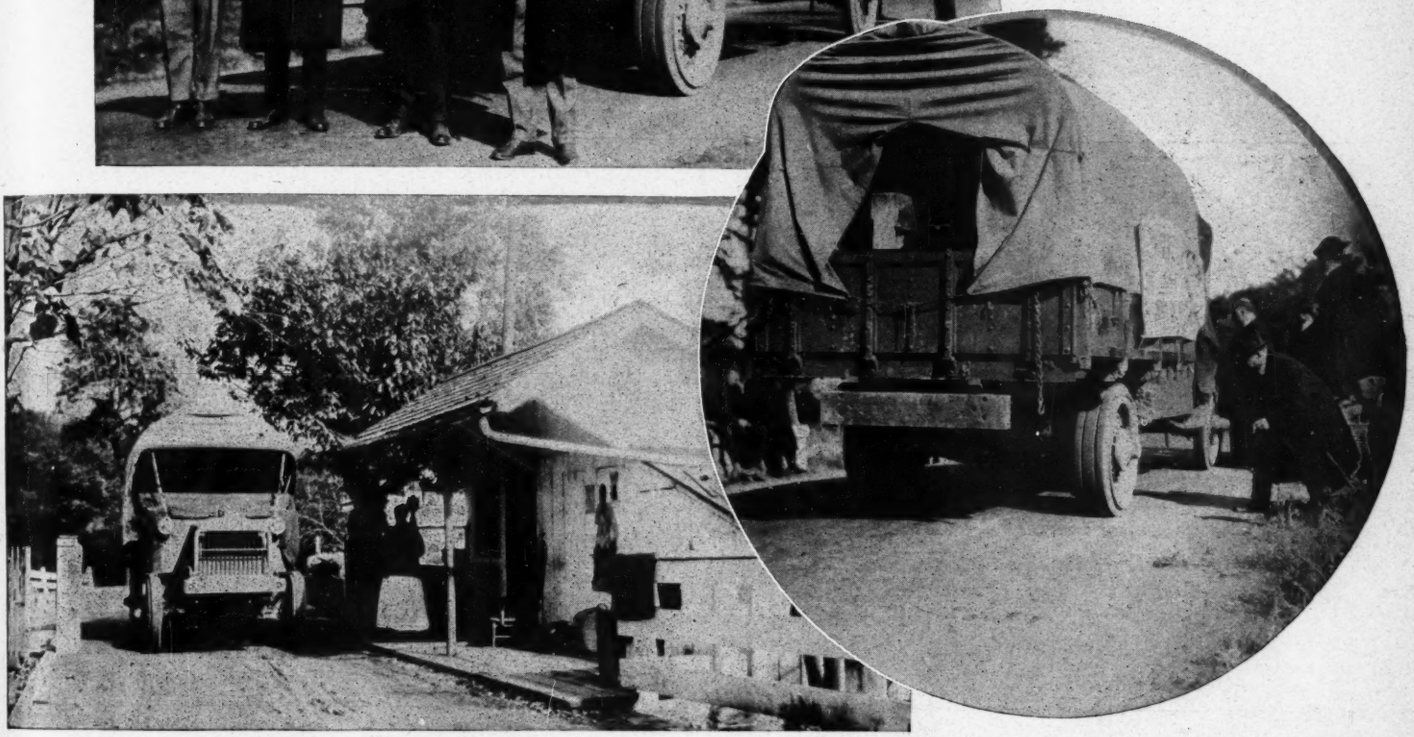
The U. S. A. Truck Enroute to the Capital

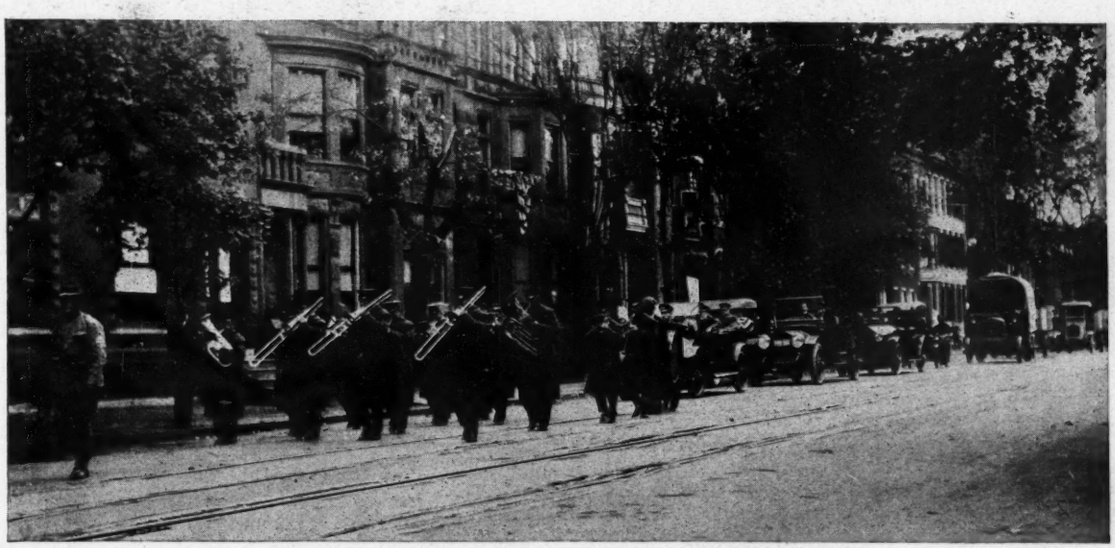
The journey of the U. S. A. truck from Rochester, N. Y., to Washington was a continuous triumphal tour through cities, villages and country districts. Above it is passing before Pennsylvania's capitol

Popular enthusiasm received the war truck all along the route. These are two of the crowds that turned out to admire the truck as it passed



Four of the men instrumental in the production of the truck. From left to right these are: Coker F. Clarkson; Christian Girl, in charge of truck production; H. L. Horning and A. W. Copeland, while below appear steps in the progress of the new war truck toward Washington

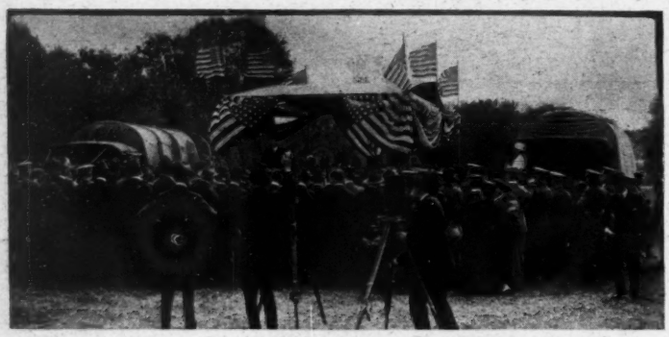




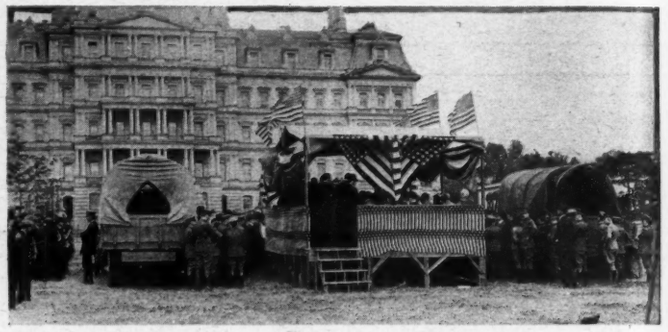
Martial honors were given the truck by enthusiastic citizens, and here is the parade that escorted the truck through Harrisburg, Pa., which was on the route between Rochester and Washington

WITH THE CROWD AT THE CAPITAL WHEN THE U. S. A. TRUCK ARRIVED

President Wilson, Secretary of War Baker, H. L. Horning, C. W. Stiger and W. R. O'Neill discuss the great war truck



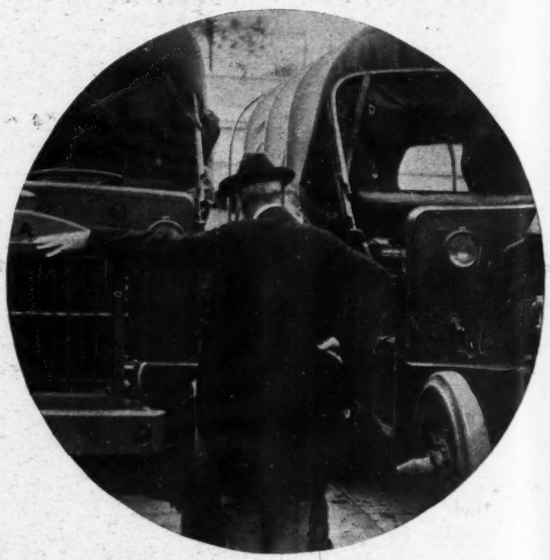
The crowd hears Secretary of War Baker make his speech of acceptance at the Capital



The two U. S. A. trucks, with the War and Navy buildings making a most fitting background

Secretary of War Baker drives one of the U. S. A. trucks through the streets of Washington before accepting them for the Government

Below, Major W. G. Wall, of National, center, with General McLachlan, British military attache, reviews the U. S. A. truck, with other foreign officers



The President of our Nation looks over the two new war trucks and finds them good, as indicated by his talk with H. L. Horning later

Eat Plenty—Eat Wisely—but Without Waste

built in Rochester, N. Y., and the other in Lima, Ohio. For road test they were driven under their own power over the mountains to Washington.

"The engineering work is now finished, and the Class B heavy-duty war truck is ready for quantity production."

H. L. Horning, chairman of the automotive products section of the War Industries Board, discussed the truck at length with President Wilson, who was particularly interested in the short schedule allowed for the design and production of the first truck and in the remarkable record which even exceeded the schedule time. The President also was interested to learn the trucks can operate efficiently on inferior grades of fuel if the necessity arises and expressed great satisfaction at the promptness with which many manufacturers of the parts responded.

To name those present would be to name those whose names are before the public every day in war work for the Government. The heads of the engineering divisions who did the designing work, the President and members of the Cabinet were there. Representatives of the industry at large were there. The Army was represented, the Navy, it was a National affair, no one department and no one branch of the Nation's interests were supreme. In accepting the trucks for the Government, Secretary of War Baker said:

"In America we have seen many stimulating evidences of the willingness and enthusiasm with which our people are cooperating in our preparation, but I know of none more significant than the two mechanical triumphs which have been worked out in the production of the Liberty motor for the airplane service and the production of the standardized truck for army transport.

A Soldier's Work

"I want to say to those who have been engaged in this work that while their occupation has seemed somewhat less spectacular, perhaps, than the uniformed military activity of the soldier in the battlefield, it is in no sense a less significant contribution to the advancement of our national cause. Therefore, on behalf of the Government, and notably on behalf of the War Department, I express to all those who have been instrumental in bringing this great thing to pass our very grateful and hearty appreciation and I extend to them also the compliments of the Government upon the speed and certainty with which they have done their task, and the fine success which has attended their efforts."

CLARENCE H. BOOTH RESIGNS

Detroit, Oct. 22—Clarence H. Booth has resigned as president of the Scripps-Booth Corp., and no definite information is available as to his successor. On reliable authority it is stated that W. N. Little, at one time head of the Sterling Motor Co., is vice-president, and that the Scripps-Booth Corp. is to pass into the control of large and influential motor car interests. In about three months new models and prices are expected.

Rulings on Car War Tax

Treasury Department Amplifies and Explains Effect of Levy on Sale Price

Supplement to N. A. C. C. Opinions as to Requirements

WASHINGTON, D. C., Oct. 23—Special telegram—The Treasury Department has made several additional preliminary rulings concerning the war revenue tax on motor vehicles, amplifying and explaining the rulings obtained by the National Automobile Chamber of Commerce and published last week in MOTOR AGE. The new rulings do not alter materially the others and cover such specific points as the method of charging the tax to the consumer, the floor tax, the tax on used cars. The method of handling taxes on cars sold on conditional bills of sale and chattel mortgages through these rulings, which are the result of interviews with Deputy Commissioner G. E. Fletcher of the international revenue office; E. C. Johnson, solicitor of the international revenue office; P. S. Talbert, chief of the law division, and Dr. Gilbert Brenizer of the war tax division, are only preliminary and subject to change. They are:

Treasury Rulings

1—Manufacturers selling new cars and trucks on and after Oct. 4, 1917, pay a tax of 3 per cent on the manufacturers' selling price. This is on the price received by the manufacturer for the car and not the list price unless actually sold for that.

2—If the manufacturer passes the tax on, the Treasury Department believes the price the manufacturer gets for the car should include the present price of the car plus the tax collected. For example, if the maker sells the car for $800 plus the war tax of $24, making the selling price $824 with no reference to the tax, the Government will assess the tax of 3 per cent on $824. For the manufacturers to receive the full $800, plus the war tax, his billing price would have to be $824.74 of which 3 per cent, or $24.74, would be paid to the Government. The maker's price, therefore, would be 97 per cent of the total charge to the customer. This appears to be a tax on a tax, but the Treasury Department rules that the tax is on the gross amount the manufacturer receives and the tax is part of that amount, even though later paid over to the Government.

3—Wholesalers or combined wholesalers and retailers holding new cars or trucks for sale at the opening of business, Oct. 4, must pay 1½ per cent on what is paid to the manufacturer for them. However, no tax is assessed on cars or trucks sold and delivered prior to May 9, 1917, where the title has been retained as security. Dealers who do both wholesale and retail business must pay a 1½ per cent tax on all new cars held Oct. 4 whether subsequently sold at wholesale or retail.

4—Used cars are not taxable whether held by manufacturers or wholesalers.

5—Chassis are considered motor cars and are taxed accordingly.

6—If the manufacturer or wholesaler-retailer sells a taxable car or truck to a dealer under contract made prior to May 9, 1917, then no matter what the contract may say about taxes, the dealer who buys the car or truck must assume the tax and pay it to the seller who will in turn pay it to the Government.

7—The manufacturer's tax accrues when the car or truck is sold, and this means when the title to the merchandise passes to the buyer, whether by the physical transfer of property or the bill of lading representing it. Therefore, the title passes when the merchandise is delivered to a carrier who is the agent of the buyer or the bill of lading is put in the mail or delivered to a bank.

8—A car delivered on a chattel mortgage is a sale when the title passes and not when the mortgage is paid off.

May Release U. S. Cars

9—Cars or trucks sold to the Government probably will be released from the tax, though the person making the sale must make application to the Treasury Department for an order releasing the article from the tax. Cars and trucks sold to foreign governments are taxable.

10—Branch houses in district and separate corporations from the manufacturers' corporation do not subject the manufacturer to taxes incurred by the branch.

11—Where extras are shipped with a car and make one sale, the manufacturer is taxed on the full amount, but where cars are shipped standard and extras added, these would not be taxed.

12—The Treasury Department does not look with disfavor on the plan of averaging the tax so that the amount paid by the ultimate buyers of a certain type of car shall be the same, irrespective of different discounts given various classes of dealers.

13—Wholesalers should make returns on the floor tax with checks covering the proper amount before Nov. 2, 1917. The payment may be extended to a date not exceeding seven months from the passage of the act upon the filing of a bond for the payment which must not be less than double the amount of the tax and in no case less than $1,000. Liberty Bonds are acceptable.

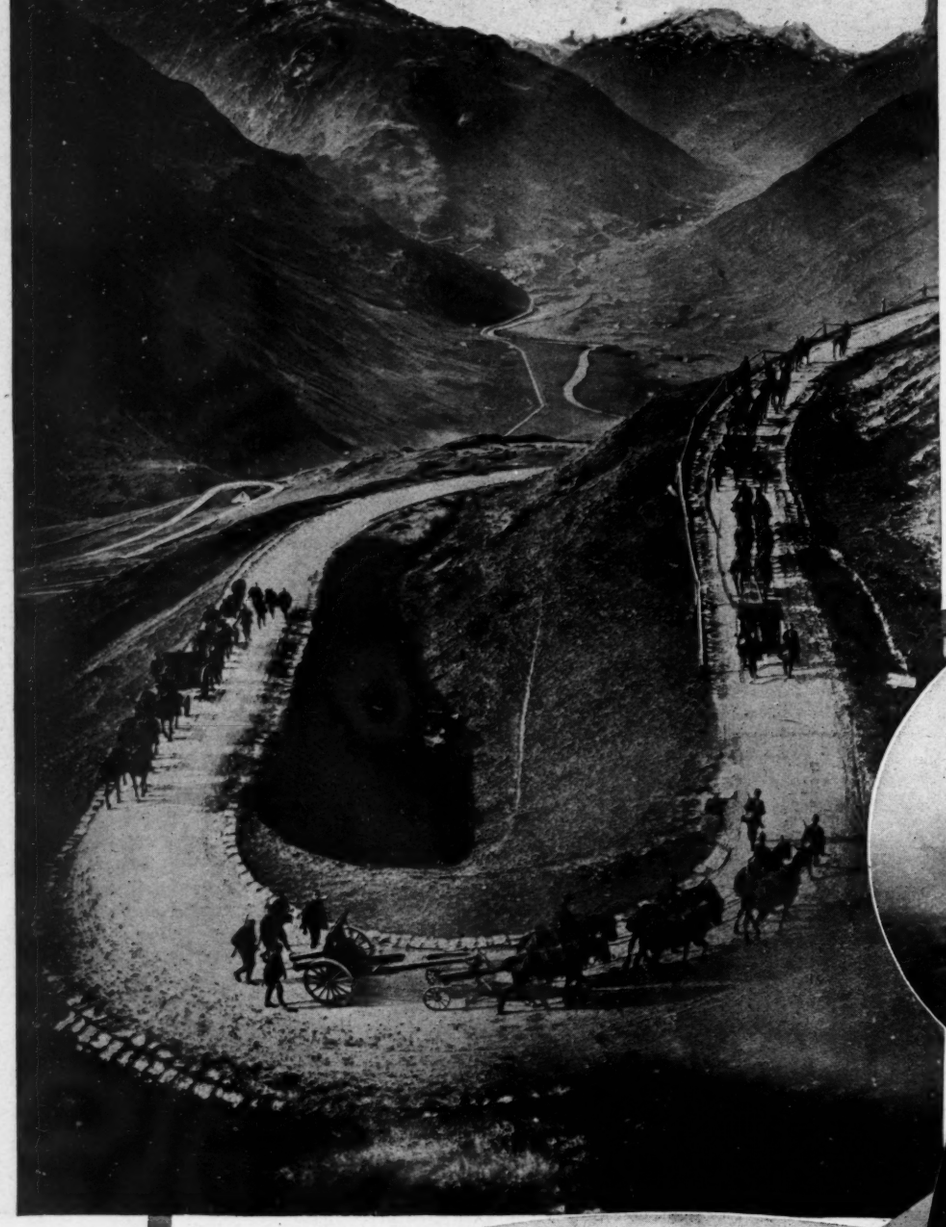
14—Manufacturers should make reports with checks for the proper amount on their October sales any time before the end of November, making monthly reports thereafter.

U. S. WORKERS

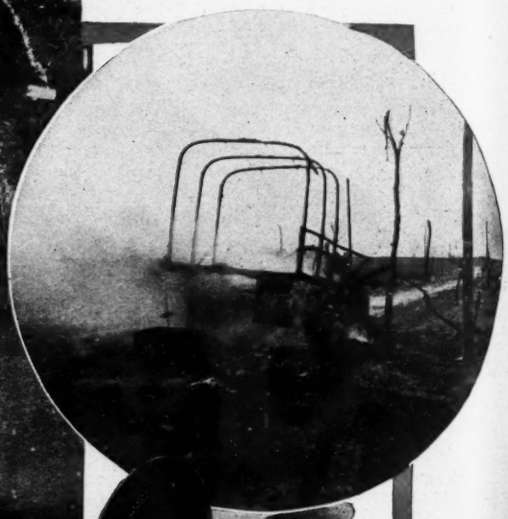
C. L. Laine has been commissioned captain in the motor equipment section, ordnance department, U. S. R. Mr. Laine formerly was sales agent for motor car equipment at Indianapolis, Ind.

Frank R. Bacon, president of the Cutler-Hammer Mfg. Co., Milwaukee, Wis., has been promoted from captain to major in the United States Reserve.

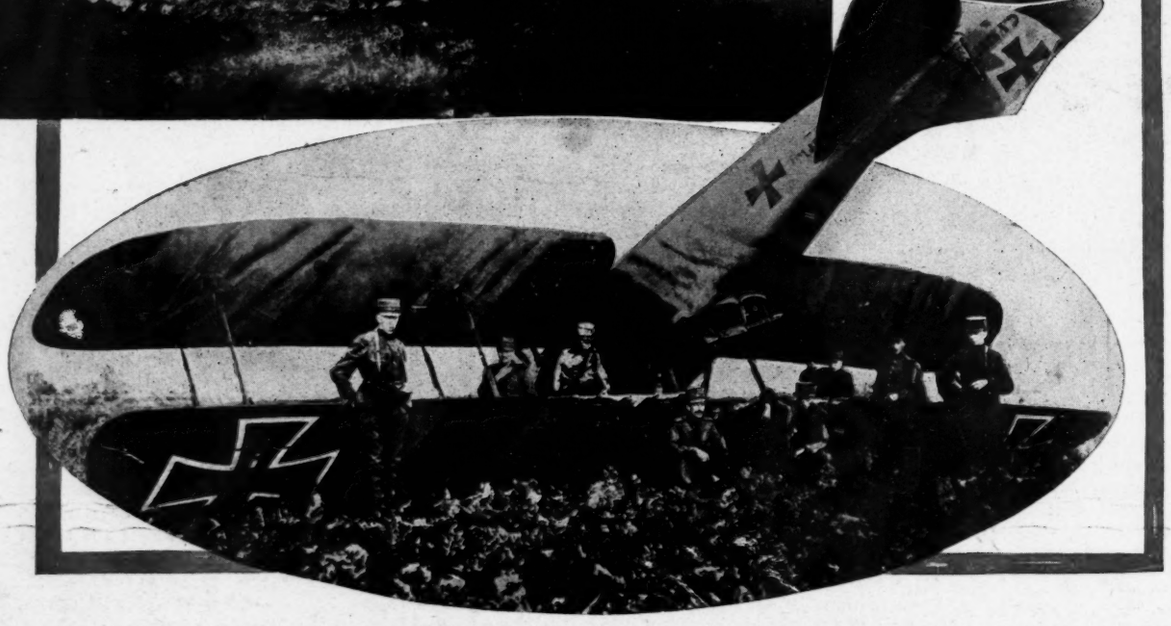
THINGS THAT HELP U. S. CITIZENS REALIZE THAT THIS WAR IS WORLD-WIDE



An ideal mountain military road in the "Cradle of the Peaks"—with Swiss mountain artillery passing over the Oberalp pass. This road is of the type that has helped armies win wars since time

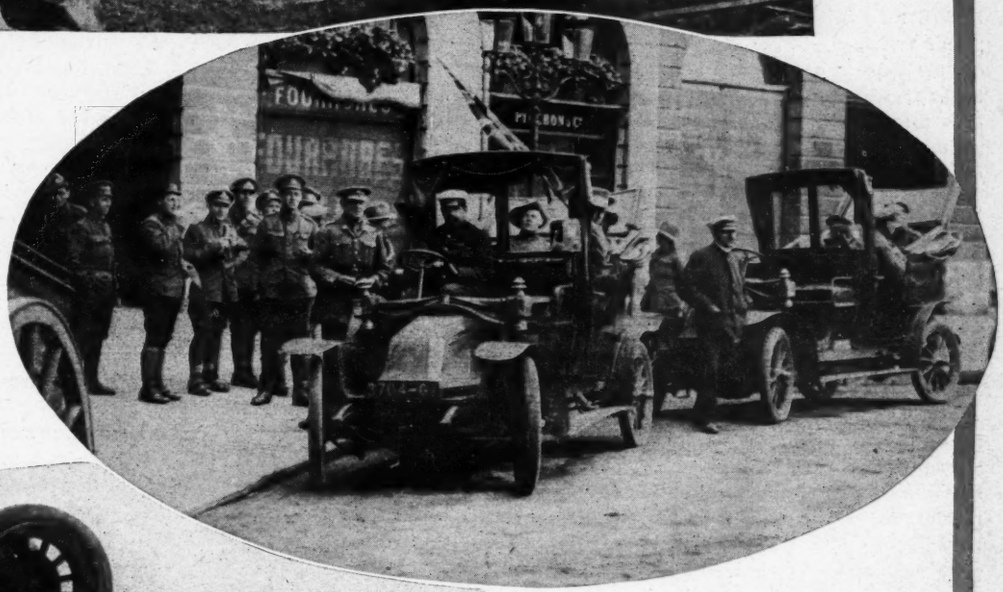


This American truck went to its death on a funeral pyre after heroic service in transferring wounded and bringing up ammunition. Its pyre is on one of the great battlefields

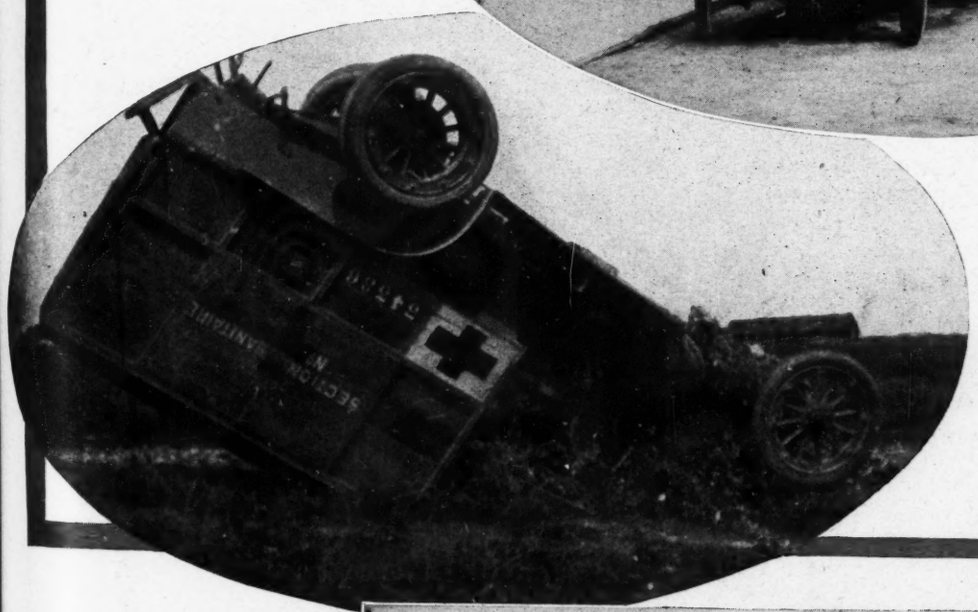


A German plane in Holland territory. The aviators have been interned

This photograph was taken from a German aviator brought down within the French lines. It shows a group of German Red Cross members — yes, even the Germans have a representative body of the world's great humane organization — gathered about a burning French airplane that had been brought down inside the Hindenburg line during a flight over the enemy's lines

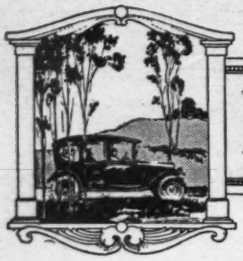


Paris has the habit now of giving the troops stationed within her portals an airing from time to time in motor cars. This detachment is composed of British Tommies



Let this be an example to all ambulances. Be prepared to stand on your dignity and not to let a shell upset you on your nose as one did this motor ambulance

This is an unusual scene, unusual because the place of the armored car seems to be in the thickest of the fight, with bombs bursting in air and the rest of the attendant dangers that armor is made to resist. Here, however, the armored tanks are drawn up for army inspection in Versailles



EDITORIAL PERSPECTIVES

The Saddest Liberty

THAT person is to be pitied who cannot afford to purchase a Liberty Bond; but those persons are to be doubly pitied who are living so far behind the spirit of to-day that they cannot see why they should buy a Liberty Bond. The saddest persons living when this war is over will be those who have not got into the spirit of the war. The saddest people will be those who have not experienced the spirit of sacrifice, which is a part of this war. Those people will really be sad indeed who find the war is over and they did not share in it. They will be sad to think, if they ever awake to the fact, that they are not in step with the march of democracy; that they are, in plain words, behind the times; that, in still plainer words, they are not reading the movement of events as clearly as are others.

BUYING a Liberty Bond is placing your self on record with your own conscience and with the Nation that you are in the front van of twentieth century civilization. The Liberty Bond will be proof a score of years hence that you were a doer and not a mere talker. Actions speak louder than words. Whole industries are counting noses these days, and slackers are being set down as those who do not measure up to the new standard of international efficiency.

A CHICAGO motor car distributor, one of the healthiest financially and patriotically along Michigan avenue, told the only employee that would not buy a Liberty Bond that he was not good enough to work for them. Here we have a new criterion of merit. It is not the mere $50 or $100 that you put in the bond, but the spirit back of the action. Why hesitate when you get a mortgage from Uncle Sam backed by this entire country on the money you invest. You cannot get a surer investment. If you have not bought, look your self squarely in the face and do not stop looking until you can go to any man in khaki and tell him why you did not buy a bond.

Speedway Racing

ANOTHER effort has been made to tear wide open the entire organization for controlled motor racing as it has been under the Contest Board of the American Automobile Association. The attempt which came to the surface at Uniontown last week has all the earmarks of the usual outlaw system with all its cast iron regulations, which are all on the side of the management, and in which the driver has sold himself body and soul and surrendered every right as a sporting identity.

IF THIS latest effort of outlaw action had the united backing of the speedways, it would be considered serious, but although reported to be backed by the leading speedways, such speedways as Indianapolis, Chicago, Cincinnati and Providence deny any connection with it. They all stand for controlled racing by some impartial body, and their giving the lie to the reports from Uniontown brands the new organization as one of the out and out outlaw types with some one dictator to wield the whip over all the drivers.

IT SEEMS as if circumstances were taken advantage of to get the signatures of many drivers at a time when they were badly in need of funds. The drivers had just reached Uniontown from the Chicago races, which were signal failures as money producers. Weather required a postponement of the Uniontown races, which perhaps was more than some of the drivers cared to experience. No more opportune moment could be had to flaunt in the face of these drivers a proposition for 1918 which would give them a semblance of protection and assistance, by way of free railroad transportation and free shipment of cars. The bait was too enticing and they swallowed bait, hook, dictatorship, outlawry and everything that goes with uncontrolled sport.

THOSE who signed the contract even agreed to leave the writing of new rules up to the will of the dictator and to be punished by fines or suspended for violation of such rules. There is no provision for appeal; in fact, the entire scheme is one of those sealed arrangements for the outlaw promotor who has written every clause of the contract to suit his own conditions.

IT IS not surprising to have outlaw attempts at racing made at such times as the present, namely, at the close of a season when drivers have not made enough money to keep them going. Similar occasions have arisen before, and will continue to come to the surface. Racing has not been supported during the present year, which is largely due to poor management on the part of many speedways. There has not been sufficient advertisement of the events. In some cases the prices have been too high. In other cases the drivers have not gone out and practiced in advance of the races, to give desired publicity. The main trouble has been that prices have not been popular prices and advertisements have been too few.

Army Behind the Army Wants Men!

BEHIND the men in the first line trenches there must be an efficient corps of men who do no real fighting, but who keep the actual fighting men supplied with arms, ammunition and backing if our war for democracy is to be successful. The Chief of Ordnance is making a drive to bring to full strength the Enlisted Ordnance Corps of the National Army.

The enlisted ordnance corps is charged with the supply, maintenance and repair of all cannon and artillery vehicles and equipment; all machines for the service and maneuver of artillery; all small arms, ammunition, harness, motor trucks, motorcycles, tractors and railroad cars, and is commonly known as "service of the rear."

Applicants must be between eighteen and forty-five years, citizens or declarants, and should have no absolute dependents. They must pass the regular army physical test. If accepted for enlistment, men will ordinarily be sent to an arsenal school for a period of instruction, on completion of which they will be assigned to detachments, units or organizations, with ultimate service abroad. Previous military training, while preferable, is not essential.

Many of the men will be made non-commissioned officers. Original enlistment will be as a private, the higher grades to be reached through training. Pay ranges from $30 to $97.20 per month. Men who have been called for physical service under the selective draft cannot enlist, but all others may, prior to the posting of their names.

Application blanks can be obtained from the Chief of Ordnance, Enlisted Personnel Division, Washington, D. C. If there is an opening for you when your application is received you will be authorized to enlist at the nearest recruiting station and if accepted there, free transportation will be provided to place of service.

Eat Plenty—Eat Wisely—but Without Waste

Outlaw Circuit Proposed

Plan to Overthrow Contest Board of A. A. A. Seen in Racing Association

Twenty-nine Drivers Reported to Have Signed Up

UNIONTOWN, Pa., Oct. 20—An attempt to form an outlaw association to control motor racing on certain so-called speedways in the country came to light here at a meeting held preliminary to the races to be held on the speedway here to-day, but which were postponed for a week because of bad weather. In the motive is unquestionably a carefully thought-out plan to overthrow the Contest Board of the American Automobile Association, which has sanctioned speedway racing and other motor racing since the inception of the sport.

The proposed outlaw organization, known by the high sounding and misleading name of the National Grand Circuit of American Speedways, while purporting to have submitted its plans to many of the speedways, really did not do so, and so brands itself as an individual effort on the part of a few to get hold of many unsuspecting drivers, who already, it is reported, have signed contracts for the 1918 season with the outlaw organization.

While the outlaw organization came to the surface at the meeting here, it is well known that it was conceived in another part of the country, and it is not the conception of anybody in Uniontown, although it has been attributed to Charles W. Johnson, president of the Uniontown speedway. It was known more than a week ago by certain people connected with the speedways that such a movement was under way, and such major speedways as Indianapolis, Chicago, Cincinnati, and Providence agreed to have nothing to do with such an outlaw organization, and to stand by the Contest Board of the American Automobile Association.

Rights Signed Away

It is reported that twenty-nine drivers have signed for the 1918 season with the outlaw organization, which in the contract with these drivers is represented by Johnson, the local speedway president. These drivers have signed away their very existence according to the contract and agree to drive for nobody during the 1918 season but the outlaw organization and to be fined or suspended for any violations of the rules and to be dismissed from the organization on a ten-day notice. Johnson, or whoever else controls the outlaws, has the power of adding new rules as necessary, and either he or somebody else will rule as the sole dictator in the work. The purported contract which the drivers have signed, or are reported to have signed, provides for no appeal against the management. The driver has by signing the contract surrendered any apparent rights of appeal that he has enjoyed under the A. A. A. control. It is impossible to understand how any driver would agree to the contract if he has carefully gone into all its provisions.

Under the new proposed outlaw organization, Mr. Johnson, who has signed the contracts in the name of the Grand National Circuit of American Speedways, agrees with the drivers for the 1918 racing season, beginning May 10 and ending October 31, to embrace a schedule of 2000 miles of racing on various speedways. Johnson further agrees to cash prizes on the basis of $50 for each mile of racing. He also agrees to transport all racing cars from one speedway to another free of charge and to furnish two railroad tickets and two Pullman fares to each entrant. He also agrees to give any driver injured in a race accident during his period of disability such a proportion of compensation as is prescribed for in the rules. Johnson still further agrees to create a purse for championship points, which seems to be following out the national championships, instituted by the Contest Board of the A. A. A. two years ago.

Fines Agreed On

The drivers who have signed the agreement further consent to having Johnson impose reasonable fines upon them and to deduct such amount from their earnings for violations of their contract rules. Johnson has also the right to suspend any of the drivers for violation of any of the rules, and the provision is in the contract that the driver suspended shall not be entitled to any compensation during suspension. At the same time Johnson has taken unto himself in his contract with the drivers the power to establish what he describes as reasonable rules for governing the drivers, and that these shall be binding.

So far as other speedways being consulted is concerned, Indianapolis and Cincinnati have not been approached. James A. Allison, treasurer of the Indianapolis speedway, says that that speedway is not to hold any races during the war unless it would be one in which all proceeds would go to the Red Cross or other war funds. The drivers representing the Indianapolis speedway will not be permitted to enter any races during the war, except for war funds. Manager Lehman of the Cincinnati speedway has not heard of the Grand Circuit and announces that the Cincinnati speedway, which is all paid for, is not run for the benefit of one or two individuals but is really a municipal enterprise, and that it is being put in crop. The management does not know whether any races will be put on during the duration of the war or not.

The Chicago speedway through President David Reid has announced that it will have nothing to do with the outlaw circuit. It has not been approached and was unaware such a movement was under way. Manager Reid is authority for the statement that Manager Perkins of the Providence speedway will have nothing to do with the outlaw organization.

U. S. Wants Road Men

Volunteers for Highway Construction in France Immediately Are Called

Rules and Regulations for Enlistment in Corps

WASHINGTON, Oct. 22—Special telegram—Volunteers for a highway construction regiment for immediate service in the war zone of France are wanted. They must be men experienced in some line of road construction or mechanics skilled in operating road-building plants. No pick and shovel men are wanted.

Applications should be made to Colonel E. M. Johnston, U. S. A., Corps of Engineers, 1419 F street, North West, Washington, D. C. Colonel Johnston says his desire is to obtain practical road men, particularly those who understand handling road rollers, stone crushing plants, etc., as well as blacksmiths, carpenters, quarrymen, etc. Men of draft age are acceptable if they have not been called by their local boards. The battalions to be formed will be part of the twenty-third regiment of engineers of the National Army, which eventually will include 10,500 men, more than an ordinary brigade and, so far as known, the largest in the army.

Any American citizen between eighteen and forty years of age, not called by a draft board, is eligible, and those of special experience in certain cases may obtain assignment to special duties and be made subordinate officers at rates of pay ranging from $40.20 to $96 a month and expenses. Most of the positions, however, are for enlisted men, who will receive $33 a month and all expenses and will have an opportunity to earn one of the better, non-commissioned grades.

FORESEES COMMERCIAL AVIATION

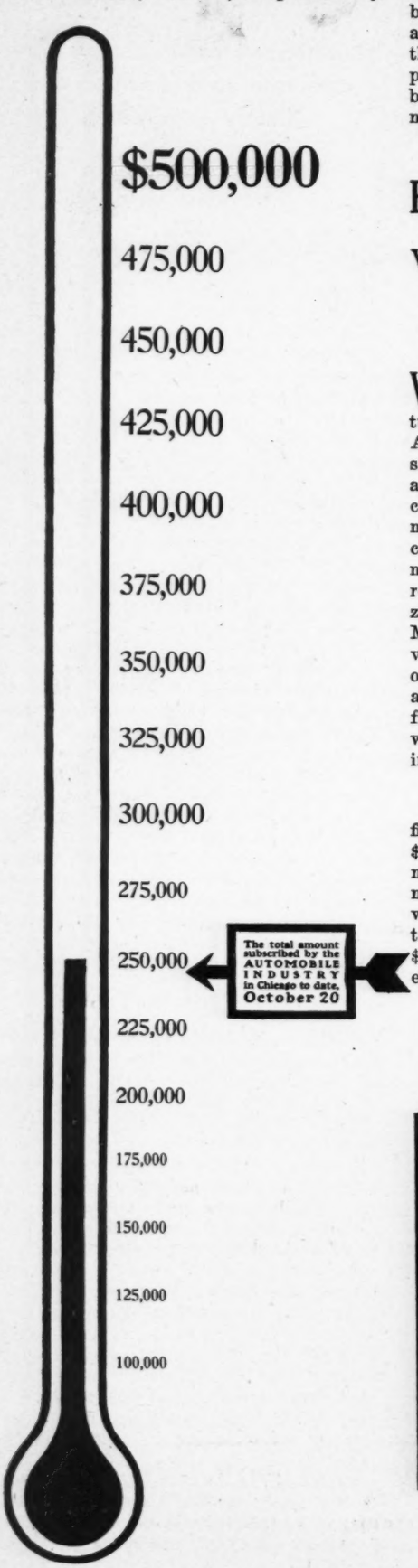
Cleveland, Ohio, Oct. 20—At the meeting of the Cleveland Section of the Society of Automotive Engineers held here last night, E. H. Sheibondy, research engineer in the Government airplane engine service, and Alfred Harris, an amateur aviator, spoke. Mr. Sheibondy discussed the type of airplanes now in use in all the principal countries, showing lantern slides of many and explaining the points of interest.

In speaking of the fuels used by airplanes, Mr. Sheibondy stated that these must be more volatile than the fuels for motor car purposes and should not boil at over 250 deg. With ordinary gasoline the aviation engines will smoke and be troubled with overheating of the valves. He predicted a large commercial use for the airplane after the war is over, capable of carrying heavy weights.

Alfred Harris, in speaking from the aviator's point of view of his machine, stated that no one appreciates the value so much as the one who flies. He spoke of the de-

sirability of having an ample reserve power factor for machines regardless of weight, because the machine having the greatest power is the safest due to the increase in the safety factor with increased speed. The slower machine, he said, is particularly dangerous on curves due to side slipping on banking.

In regard to the length of time required to teach aviators, although it now takes three or four months, the system will soon be so perfected that men will be taught to become good fliers in thirty days. There are from three to four times as many things to remember in controlling an airplane as there are to control a motor car, but these are not inherently difficult to manage.



Boosters for Liberty

Willys Urges Buying of Bonds —Those Already Bought in Industry

WASHINGTON, D. C., Oct. 23—Special telegram—"Buy Liberty bonds and turn them to double duty; make them help America and the American soldier and sailor at the same time," was the patriotic advice of John N. Willys of Toledo, motor car and airplane manufacturer and chairman of the national committee of war camp community recreation fund, given at the national conference here. Prominent representatives from cities, towns and organizations all over the United States met with Mr. Willys to discuss the problem of providing for the welfare and entertainment of the men in the communities surrounding all training camps and to make final plans for the nation-wide campaign now under way to secure the money needed for this intensive and important work.

Detroit, Oct. 20—This city is among the first to oversubscribe its official quota of $43,000,000 on the Liberty Loan, and in no small part is this due to the motor car manufacturing interests in the city. The workmen themselves, exclusive of the factories as institutions, have subscribed from $75 to $100 per man. In shops of over 500 employees—a total of 105,000 men, $5,019,850 has been subscribed, and the 220 smaller shops have turned in a total of $2,000,200 to date.

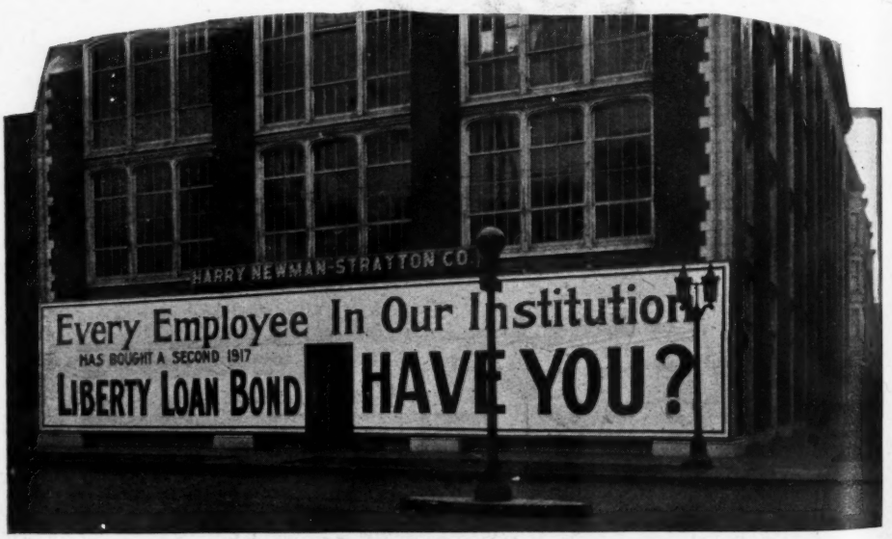
The following tabulation shows the amounts contributed by some of the motor car concerns, those in some cases showing the totals contributed by both factory and employees; others simply that contributed by one or the other.

Henry Ford (personal)	$5,000,000
Ford company	5,000,000
Cadillac	400,000
Morgan & Wright	214,600
Continental Motors	120,000
Timken-Detroit	431,000
Paige	100,000
Packard	1,500,000
Zeniith Carburetor	30,000
Hudson	38,000
Detroit Steel Products	174,000
Detroit Copper & Brass	150,000
National Twist Drill	300,000
Water Marine Motors (Receivers)	3,400

Syracuse, N. Y., Oct. 19—The H. H. Franklin Mfg. Co. has purchased $500,000 worth of Liberty Bonds and will use them in paying future dividends to stockholders besides financing Liberty Loan investments of its 3000 employees.

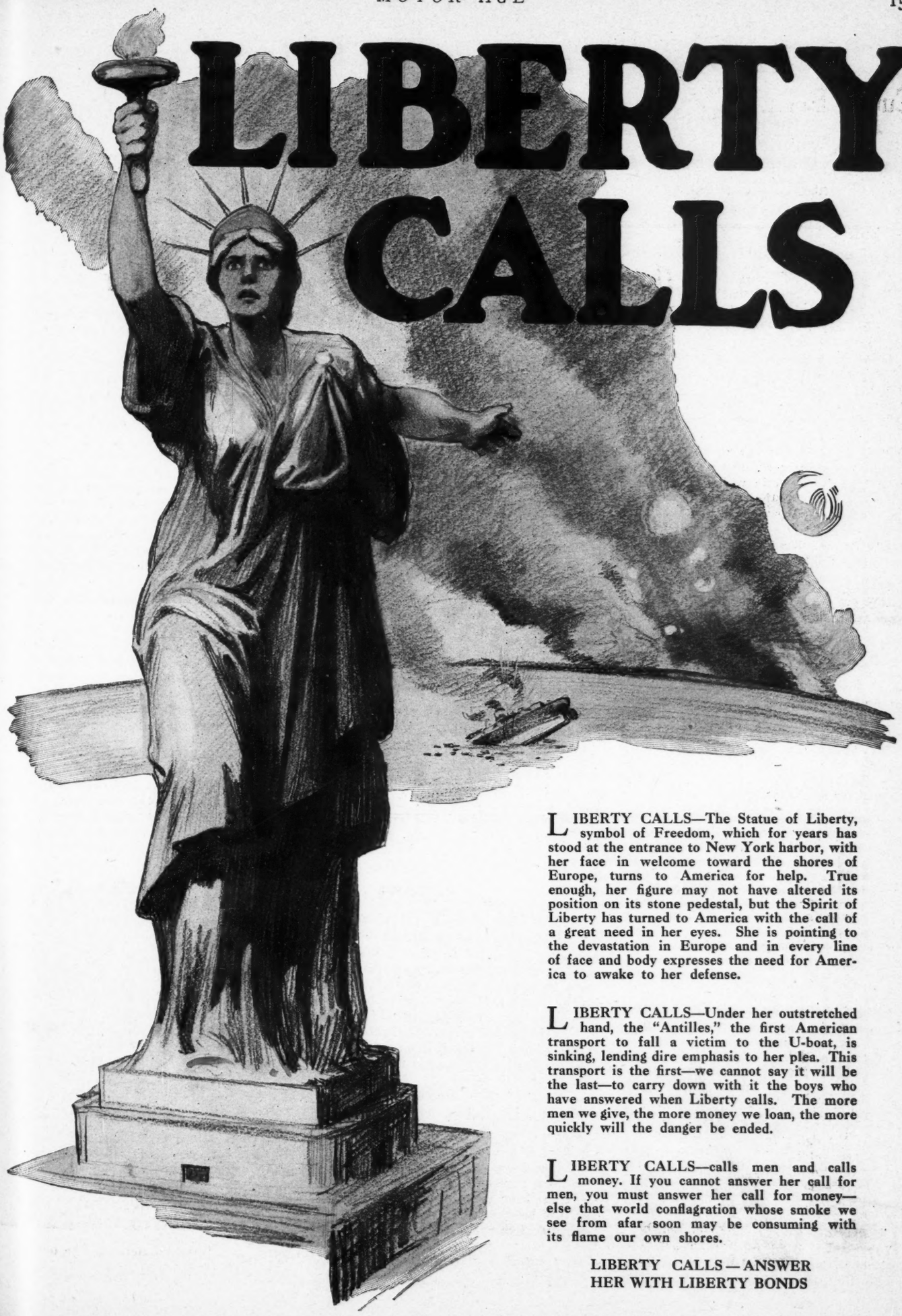
Chicago, Oct. 23—The motor trade in Chicago has put its shoulder to the wheel of Liberty Bond sales with such good results that up to this morning $375,000 had been subscribed. This was accomplished by the Chicago Automobile Trade Association, which organized its campaign a little over a week ago, and appointed a member of its loan committee from each firm belonging to the association. In keeping up the interest it publishes a daily bulletin of sales and in addition has a paper thermometer posted prominently by each member, which rises each day as the sales increase. By Saturday last, $250,000 were subscribed, and among some institutions, every employee had subscribed. Some firms subscribed from $5,000 to $10,000 in addition to the individual subscriptions.

General Motors this week subscribed $1,500,000; United Motors, $1,000,000; Chevrolet, $500,000; New York dealers, $1,500,000; New Departure Mfg. Co., $200,000 as a company and its employees much more.



The mercury of Liberty Loan subscriptions in the thermometer to the left was helped upward by the Chicago dealer, whose self-explanatory sign is reproduced herewith and shows a record of 100 per cent for the employees

LIBERTY CALLS



LIBERTY CALLS—The Statue of Liberty, symbol of Freedom, which for years has stood at the entrance to New York harbor, with her face in welcome toward the shores of Europe, turns to America for help. True enough, her figure may not have altered its position on its stone pedestal, but the Spirit of Liberty has turned to America with the call of a great need in her eyes. She is pointing to the devastation in Europe and in every line of face and body expresses the need for America to awake to her defense.

LIBERTY CALLS—Under her outstretched hand, the "Antilles," the first American transport to fall a victim to the U-boat, is sinking, lending dire emphasis to her plea. This transport is the first—we cannot say it will be the last—to carry down with it the boys who have answered when Liberty calls. The more men we give, the more money we loan, the more quickly will the danger be ended.

LIBERTY CALLS—calls men and calls money. If you cannot answer her call for men, you must answer her call for money—else that world conflagration whose smoke we see from afar soon may be consuming with its flame our own shores.

LIBERTY CALLS—ANSWER HER WITH LIBERTY BONDS

Eat Plenty—Eat Wisely—but Without Waste

Curtail English Motoring

Gasoline Will Not Be Sold to Private Citizens After November 1

Restriction to Hold Good Until After War

LONDON, England, Oct. 14—A drastic new war order, just issued and which will take effect Nov. 1, states that no gasoline for pleasure driving will be sold in England after that date. The order included all oils, gasoline and liquid substitutes, and means that unless the car is used for strictly Government work it cannot be run.

Since April 1 the car owner has been unable to obtain gasoline unless he could show that the work in which the car was employed was of national importance. The importation of cars had been forbidden for over a year then, and there had been practically no opportunity to even buy a touring car in England since, as the supply on hand was exhausted soon after the prohibition.

The price of gasoline has practically become prohibitive for the car owner. The latest increase, Sept. 1, was 16 cents a gallon so that the retail price throughout the country was $1 a gallon, with an additional cost of 12 cents a gallon paid by the holder of a license before he claimed his right to purchase fuel. This brought the price up to $1.12 a gallon.

That the scarcity of supply, said to have brought on this drastic restriction, has been due to the impossibility of obtaining enough for the enormously increased use by the government rather than to the private owner is shown by the recent investigation made by the board of trade in England. The report showed that only 9 per cent of the fuel was consumed by privately owned motor cars, and this included all private cars employed on Government work and those in connection with munition factories.

The order gives the private owner just sixteen more days' use of his car until after the close of the war.

LIGHT OVERLAND IS DELAYED

Toledo, Ohio, Oct. 20—The new light model of the Willys-Overland car, announced in a previous issue of MOTOR AGE, will not be offered to the public until the summer of 1918. The car is designed to be produced in quantities, and because of present difficulties in getting material and machinery, the delay in getting into production is necessitated. As it will be a small car, in the low-priced class, there will be no interference or competition with the present models.

REPUBLIC CAPITAL $10,000,000

Youngstown, Ohio, Oct. 19—The Republic Rubber Corp., formed by the merger of the Republic Rubber Co. and the Knight Tire & Rubber Co., eventually will take over the entire physical property and assets of both companies. The Youngstown factory alone is doing a business of $12,000,000 a year, and it is estimated that the business of the combined concerns during the coming year will be from $18,000,000 to $20,000,000.

The Republic Rubber Corp. is incorporated under the laws of New York State and has an authorized preferred capital of $10,000,000, divided into 100,000 shares with $100 par value. It is understood the main office will be in Youngstown and that the present officers and directors of the Republic Rubber Co. will act in similar capacities in the new corporation.

ESTIMATES BUSINESS AS $60,000,000

Akron, Ohio, Oct. 19—H. S. Firestone of the Firestone Tire & Rubber Co. estimates the business will be $60,000,000 this year. This will be an increase of approximately 100 per cent over last year, when the business amounted to $36,000,000.

E. FORD APPEALS TO WILSON

Detroit, Oct. 19—Edsel Ford has made a final appeal to President Wilson for exemption from army service through the exemption board. This is the last step that he can take in attempting to be exempted from service. Exemption is being asked on industrial grounds. If not allowed, he will be called at the next mobilization.

FORD SMELTING PLANT IN 1920

Detroit, Oct. 19—It is estimated that at the present rate of progress the Ford smelting plant will be completed and in operation by the first part of 1920. Much of the output of this plant will doubtless be used by the Ford Motor Co. and by the tractor plant of Henry Ford & Son. The buildings at the plant are practically without exception of concrete and brick construction, cover a tract of land nearly a mile long and will employ, it is said, about 100,000 persons.

ROSS MAY MOVE TO COAST

Detroit, Oct. 19—Permanent receivers are being appointed for the Ross Automobile Co., and definite announcement will be made in about a week. Material change in the plant is expected, and there is a possibility that the company will move to the Pacific coast and concentrate on an eight-cylinder model instead of the six-cylinder model, as announced some time ago.

PERLMAN SALES BY JACKSON

Jackson, Mich., Oct. 20—Hereafter the sales end of the Perlman Rim Corp. is to be conducted from Jackson, Mich., instead of from New York as formerly. A sales agreement has been made whereby the Jackson Rim Co. becomes the sales department of Perlman. Perlman, which is a part of the United Motors Corp., has had an unprecedented business during the last twelve weeks.

Place Truck Contracts

Quartermaster to Give Out Orders for All War Trucks by November 1

Parts for 10,000 Already Are Ordered

WASHINGTON, D. C., Oct. 22—Special telegram—All contracts for the new heavy-duty war truck are to be placed by Nov. 1, according to present plans of the Quartermaster's Department. Axles, engines, transmission and steering gears already are ordered for 10,000 Class B trucks, and the remaining contracts will be placed soon. Trucks are purchased by the Quartermaster's Department working co-operatively with the War Industries Board. The director of the military truck production section arranges with all makers of each part for specified dates when they visit him at board headquarters and discuss the form of contract and receive specifications and necessary information. The board, in turn, hands all available information over to Brigadier-General Chauncey B. Baker, who places the actual contracts after bids by makers.

"Parts makers," states General Baker, "have been willing to sell Government at same terms on a single order as they secure from large companies buying on long-term contracts, and if patriotism of the industry is to be judged by the attitude of parts makers in this particular situation it would be 100 per cent."

It is expected that the first delivery of trucks will commence in January and that 10,000 will be completed by the latter part of June. Following the completion of contract distribution, the military truck production section will devote its efforts chiefly to actual truck production.

TO POLICE FORD SERVICE

St. Louis, Mo., Oct. 20—The St. Louis Ford Dealers' Association has been organized here and will take up the work of policing the Ford service, both as to car and accessory stations. The ten agents here are members and the association has been approved by the Ford factory sales organization. It is a part of the plan to inspect all accessories offered for sale for Ford cars and if they are not worthy to warn buyers of cars against them. Also to warn against venders of starting and lighting systems who do not keep up the service. The officers are Milton B. Strauss of the Lafayette Motor Car Co., chairman; C. H. Tevis of the Tevis Motor Co., vice chairman; William D. Walsh, Walsh Motor Co., secretary. Semi-annual meetings will be held.

MEXICAN BUSINESS FALLS OFF

El Paso, Tex., Oct. 19—The Mexican market, which has been the "Golden Egg" for southwestern motor car distributors, has been affected to a slight degree by the

For Food Economy Will Help Win the War

announcement that an export license for all internal combustion motors must be obtained before international business is permitted. Mexican owners have misconstrued this to mean that it is a ban on motor cars, whereas it is only a license to do business. However, when the license becomes effective business will again resume its previous standard. Export duty is still free, the period having been extended to Dec. 31, 1917.

If there is not too much red tape in getting licenses, Southwestern dealers should reap a harvest from this field, as conditions are more settled and several of the old reliable mines, so long closed, have resumed operation. Temporarily El Paso distributors having salesmen traveling in Mexico have withdrawn them.

HYDRAULIC ACQUIRES CANTON

Cleveland, Ohio, Oct. 20—The Hydraulic Pressed Steel Co. has acquired possession of the Canton Sheet Steel Co. of Canton, Ohio, thus gaining control over its product from the raw steel to the finished form. An amount of $4,000,000 is involved, half of which will be paid in cash. The Hydraulic Pressed Steel Co. plans later to consolidate all of its various interests including its subsidiary, the Cleveland Welding & Mfg. Co. C. A. Irwin, founder of the Pressed Steel Company, will continue in active charge.

40,000 1918 REPUBLIC TRUCKS

Alma, Mich., Oct. 19—The Republic Motor Truck Co. will manufacture 40,000 trucks during the coming year, according to the plans of the production department. To care for this increased production, additions to the plant are now under way which will increase the shop floor space 70,000 sq. ft. The production from Jan. 1, 1917, to July 1 shows 9,677 trucks were produced, which is 3,600 more than was produced in the same period of 1916, and the planned increase for 1918 shows a still greater increase.

BAILEY COMPANY INCORPORATES

Chicago, Oct. 19—The George D. Bailey Co., Chicago, has been incorporated for $25,000, to manufacture the Bailey ball thrust bearing, which replaces the flat thrust washer used as standard equipment at the left gear side of the differential on the Ford and Chevrolet 490 cars, together with the Rayfield coupling for magneto, generator and pump shafts.

Before this the Ahlberg Bearing Co. has been exclusive distributor for the Bailey products, but Bailey now will market through jobbers and dealers direct, though Ahlberg will continue to handle the line.

TO EXCHANGE ELECTRIC PATENTS

Detroit, Oct. 19—The Detroit Starter Co. has made arrangements with the Ward Leonard Co. of New York City for exchanging of patents and for a closer working relationship. All subsequent electrical systems will be equipped with the Ward Leonard controllers. The Detroit Starter Co. manufactures Genolite lighting systems and the speedorator for Ford cars.

Around the Show Circuit

New York Holds Annual Electric Display—Salon Dates Are Set

Exhibitions at Atlanta, Dallas and Pittsburgh

NEW YORK, Oct. 19—While the domestic appeal predominates at the annual electric show which is being held at the Grand Central Palace this week, electric motor cars, storage batteries and various electrical appliances for the car or garage are among the exhibits. A good deal of space has been taken by Government departments and the Red Cross. The Signal Corps, the Department of Agriculture, the Census Bureau and the Weather Bureau, are all represented.

The Westinghouse Electric Mfg. Co. is showing Bakelite micarta gears, mercury arc rectifiers and small motors among its other exhibits.

The General Electric Co. shows various products of its research laboratory, known as one of the best equipped corporation research laboratories in the country, and among them are two used in the motor industry, tungsten metal used as a substitute for platinum for electric contacts, and molded compound insulators as used for magneto parts, junction boxes, distributors and so on. An electric radiator heater made by the Hughes Heating Co. is shown by the Western Electric Co. The device is for placing under the hood of the motor car to keep the water from freezing in cold nights in an unheated garage.

Three makes of electric vehicles are exhibited, the General Vehicle Co., Long Island City, N. Y.; the Ward Motor Vehicle Co., Mount Vernon, N. Y.; and Baker, Rauch & Lang Co., Cleveland, Ohio. The General Vehicle is showing a 3½-ton truck with slat body, loaded to capacity with baled rope. These trucks are made in capacities of from 1000 lb. to 6 tons. General Vehicle also is showing one of the Gnome airplane engines for which it holds the American manufacturing license. The model is a 100-hp. and is accompanied by a display of the various parts.

Ward has a 2-ton truck chassis and a 750-lb. chassis on display. The 750-lb. is shown without battery, but the 2-ton is complete with battery. Two attractive passenger cars are shown by Baker Rauch & Lang. Both are the model BX-7, four-passenger, inclosed.

Three manufacturers of storage batteries are represented at the show, the Electric Storage Battery Co., Philadelphia, Pa.; the Philadelphia Storage Battery Co., Philadelphia, Pa.; and the Edison Storage Battery, Orange, N. J.

Salon Dates Announced

New York, Oct. 19—As usual the Automobile Salon, Inc., exhibit will be in the grand ballroom of the Astor in New York and in the Elizabethan room of the Congress, Chicago, this year. The dates are, for New York, Jan. 2-9, and for Chicago, Jan. 26-Feb. 2. The dates of the Astor salon do not agree exactly with those of the New York national show, though the Chicago dates agree with those of the Chicago national show. New York's show at the Grand Central Palace will be held Jan. 5-12, as already announced.

Space has been taken for exhibits of the following: Rolls-Royce, White, Lancia, Locomobile, Simplex, Brewster, Daniels, Fergus, Murray, Cunningham and Biddle. Brewster, Rubay and Brooks-Ostruck have taken space for body exhibits. Additions to this list will be made later and will include certain tires and accessories.

This year the Chicago salon will be under the same management as the New York. Previously it has been under separate management, though under the auspices of the same organization. John R. Eustis is manager.

The following officers of the Automobile Salon, Inc., have been elected: President, E. Lascaris, De Dion Bouton; vice-presidents, Thomas E. Adams, Lancia, and Leon Rubay of Rubay Co.; secretary-treasurer, Robert W. Schuette, Rolls-Royce.

Atlanta Show is Prosperous

Atlanta, Ga., Oct. 19—The Southeastern show is being held in a new $75,000 building, erected especially for motor shows. The total exhibit space of 40,000 sq. ft. is crowded to the limit by Atlanta dealers, the Atlanta Automobile Association having contracted for all available room. Hundreds of planters from all sections of the South are visiting the show, and display particular interest in the exhibits of farm tractors. The new 1918 cars are on hand, and dealers report many sales.

Texas Holds Fifth Annual

Dallas, Tex., Oct. 20—The Texas show opened Oct. 13 with twenty-six exhibitors of motor cars, nine exhibitors of trucks and ten exhibitors of accessories. The show is being held in connection with the state fair, and it is estimated that 300,000 persons will have visited it before the closing day, Oct. 28. This is the third year for the motor show building, but all the exhibits are not contained in this one place. There are too many of them. Last year more than a dozen exhibits were displayed in tents, and this year the implement building, with 90,000 sq. ft. of floor space, is in use also, as well as six exhibits under canvas and three permanent display houses built by exhibitors on the fair grounds.

The show is under the auspices of the Dallas Automobile Trade Association and is the fifth annual. A new feature this year is space in which cars may give demonstrations. The building opens into a vacant space, and the cars are driven through one exit to this space, where they are demonstrated.

Three Hundred Cars at Pittsburgh

Pittsburgh, Pa., Oct. 19—About 300 different cars, representing seventy-four makes, are on exhibit in Motor Square Garden at the motor show this week. A great variety is shown, runabouts, chummy roadsters and sedans being very conspicuous, and high-priced cars are represented more

Eat Plenty—Eat Wisely—but Without Waste

than in previous years. The decorations are fitting to the season and follow a general color scheme of blue, gold and white, with autumn leaves used profusely. No gasoline is allowed in the Garden this year, which places the exhibition in a class with the national shows in that respect.

The opening night was featured by motoring parties from Uniontown, Washington, Greensburg, Beaver, Butler and New Castle, Pa., who took advantage of the fine weather to attend the show. Pittsburgh firms had sent invitations to country dealers and prospective buyers throughout Western Pennsylvania, Eastern Ohio and West Virginia.

The show is being held under the auspices of the Automobile Dealers' Association of Pittsburgh. John J. Bell is general manager. Forty-nine motor car dealers have space, and three accessory firms are exhibiting.

WAR LID TIGHTENS

Washington, Oct. 19—The order of Secretary of War Baker to the effect that names of corporations to which Government contracts for army supplies are given shall not be made public is in effect. The Council of National Defense, through Secretary Clarkson and the committee on supplies, states that now "the lid is on" with respect to such orders.

MAY EXEMPT SKILLED LABOR

Washington, Oct. 19—The labor shortage may cause the War Department to send battalions from the cantonments to the factories where they are needed urgently. At any rate, it is expected that more liberal exemptions on account of industrial needs will be made in the second draft. The War Department is making an industrial census of the cantonments and will take a similar one when examinations for the second draft are made. In this way a record of all suitable for employment in industrial establishments, such as the motor industry, for instance, where the need for help is most urgent, will be obtained. A war service labor board may be established soon to handle these problems, as Government officials are strongly in favor of such a board.

FORD TRACTORS TO ENGLAND

Detroit, Oct. 19—The first shipment of a carload lot of Ford tractors for England was made this week. It is stated that production now is standardized and from now on shipments will be made regularly until the entire order of 7,000 tractors is completed. It is doubtful whether any tractors will be placed on the American market until early in the spring.

DREXEL ORDERED SOLD

Chicago, Oct. 19—Drexel Motor Car Corp. stockholders have failed to present a plan for re-financing the company which is satisfactory to the creditors and the property is ordered sold at auction October 24, at a minimum price of $102,000.

To Race Across Ocean

Caproni and Handley-Page to Stage Air Contest Next Spring

English and Italian Factories Working for Success

CHICAGO, Oct. 22—That transoceanic air flight predicted by Caproni may not be so far distant after all, and will not be if Caproni or Handley-Page are successful in their efforts for bringing about this by spring. A transoceanic airplane race has been scheduled for next spring, with the Handley-Page Co. of England and the Caproni company of Italy as entrants, and rivalry between these two companies for the honor of sending the first flying machine across the Atlantic is expected to add to English and Italian activities in airplane construction this winter, as both companies are taking great interest in the proposed race.

The Handley-Page Co. has sent officials to this country to plan the details of the trip. The Caproni company already has announced it will send a machine on the long voyage and has made several spectacular flights in this country with the type of machine it proposes using for the transoceanic trip.

Developments in the industry having to do with airplanes in general continue. The Defiance Machine Works, Defiance, Ohio, has increased its capitalization from $600,000 to $1,200,000 to care for plant extensions and increased production, part of which will be used for airplane engines and parts. This company also is making tractor, motor car and motor boat engines in addition to a usual line of wood-working machinery.

Work is progressing at one of the Buffalo plants of Curtiss on two flying boats that have a wing spread of 90 ft. They are of triplane construction and carry a substantial boat, which is to be manned by four or five men. These flying boats are being built for patrol service and will be armed with 3-in. guns. Sunbeam engines are fitted, and a speed of 90 m.p.h. is contemplated. Curtiss has just increased the wages of its workers, incidentally, the increase being one that will amount to $8,000,000 in a year.

The Fisher Body Co.'s airplane work has been held up at Detroit for a few days pending the arrival of stampings. The first airplane is partly assembled, and within two weeks the production should start on a continuous chain. The production will reach fifty per week with the completion of the 10-acre plant, the first units of which already are in operation.

Machinery is somewhat slower in arriving at the plant of the Lincoln Motors Co. than was expected, and production has been delayed for about a week. The plans of the company are progressing rapidly, however, and it is expected that production on airplane engines will be under way in about three weeks.

How Tests Make Better Motor Cars

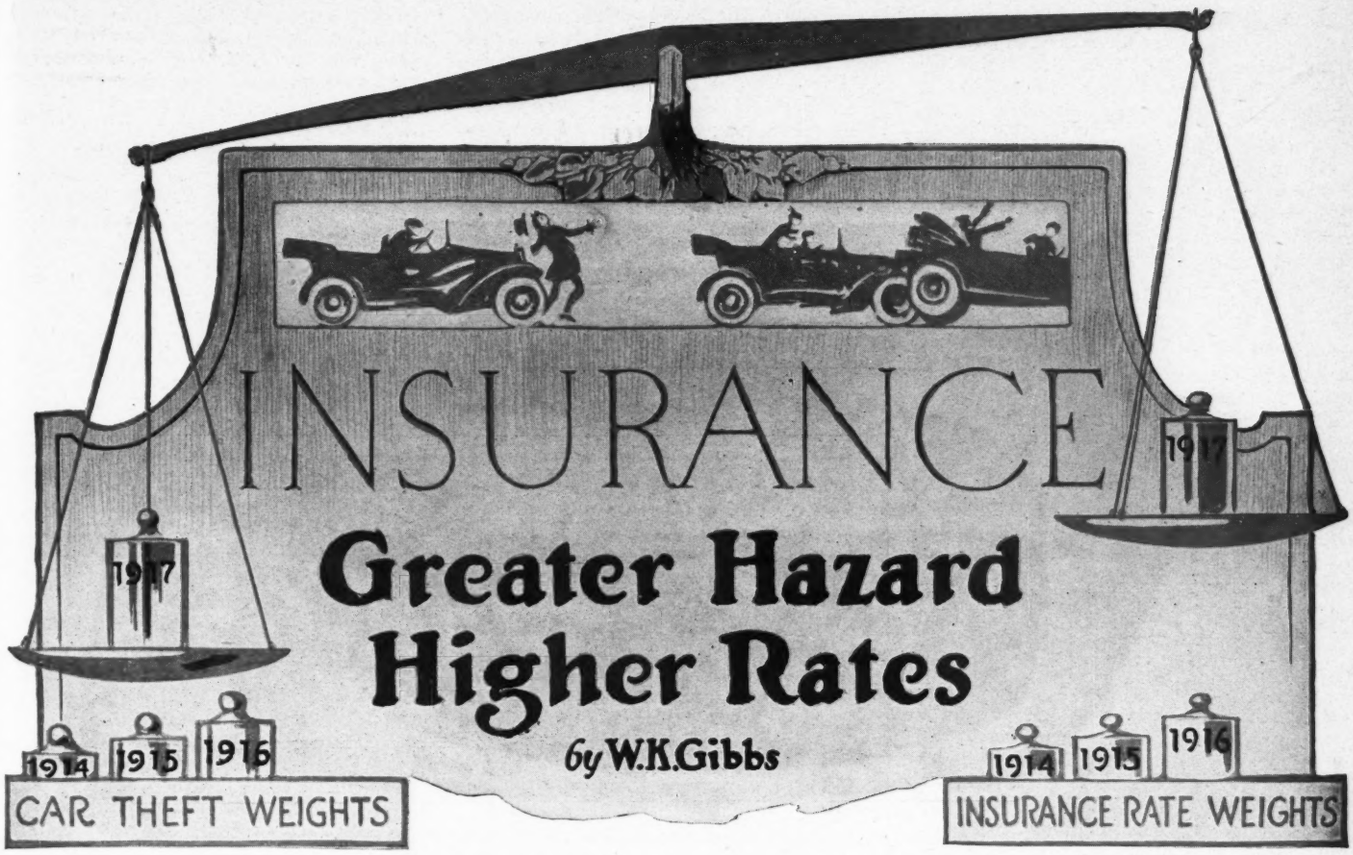
DETROIT, Oct. 19—That the design and performance of the car is in no small degree due to the tests worked out at the factory was emphasized in a paper on "Laboratory Testing as Applied to the Automotive Industry" presented at the October meeting of the Detroit section of the Society of Automotive Engineers here last night. Graphic logs of each run are kept, and fuel economy and oil consumption are observed while the engine is running, and variations are detected instantly.

The laboratory tests are exact to the smallest detail. Even the minor measuring instruments should be calibrated carefully to read in units that will save calculation later and make it possible to catch each variation in a test. With carefully built instruments and the proper handling the laboratory can build up a valuable amount of information, know just why this design is successful, that not so satisfactory, not only in tests but in selling to the private owner.

Each engine, for instance, has its individual tests. It is absurd to apply all the tests to a truck engine which are necessary to a motor car. Similarly, the tests on an aircraft engine are far removed from those on a tractor engine. It is considered necessary to test the parts to be assembled to be entirely familiar with the finished car. Changing fuels upset the previous standards as to cooling, as an example, of the need of continued testing. With kerosene as fuel the cooling difficulties are increased; how much has not been determined. The cooling question involved rear axles, radiators, carbureters, fans, hoods, pans, etc., and cooling tests are necessary to place any cause or causes for unsatisfactory cooling.

The characteristics of a new engine require analysis for determining the limit of its power. A manifold change may produce surprising results. After a change of this kind had been made the power was noticeably more, the depression higher than with the small carbureter used in previous tests. In brief, the breathing of the engine had been improved with the supplying of all cylinders of an equal, or nearly equal, volume.

The paper was the result of the joint efforts of the members of the laboratory testing committee, which is part of the general research committee having this work in charge. The members presenting the paper were R. M. Anderson, research engineer for Packard, chairman; O. C. Kreis, research engineer of the Continental Motor Corp.; and F. C. Wendland, laboratory engineer for Hudson.



Greater Hazard Higher Rates

by W. K. Gibbs

FREQUENTLY we hear of Lloyd's insuring fair weather, musicians' fingers, and fiction has it that they once wrote a policy for a titled European who sought wealth and incidentally an American heiress, guaranteeing to him that his fiancee would not exercise her prerogative of changing her mind prior to the wedding day, but these wild chances are not comparable to the chance an insurance company takes when it hands you a policy for a nominal premium which guarantees you against loss of your car through theft when you leave it out of doors or in.

It is the owner of a low-priced new car who pays the steepest rate for having an insurance company act as buffer against the life of the car thief becoming one of too opulent ease at the expense of the car owner's pocketbook. Incidentally the owner of a low-priced car pays almost twice as much today as he did two years ago for such protection. Take Chicago for an example. Two years ago the owner of a car listing at $700 or under could get fire and theft insurance at $2.75 per hundred; today it costs him $5, while the fire protection alone is reduced from $1.25 two years ago to $1 today.

Theft Experience Unstable

In writing fire insurance a company can fix an equitable rate based on previous experience, but in writing theft insurance this is not so. The experience of last year has no bearing on this year's activity of the car thief. Writing theft insurance today is almost as precarious as writing liability insurance on motor cars two decades back. The first liability policy on a motor car was written Feb. 1, 1898, and the premium was $11.25. Today the cheapest is $22.50 and the maximum for public liability, $86.50.

MOTOR car insurance has become a problem that is difficult to solve, especially that part which applies to theft. Cars are being stolen in greater numbers every year, every month in fact, and thus an insurance premium rate that applies today may be obsolete a month hence. Rates on theft insurance are the highest they ever have been and they may go higher. Moreover, some companies may soon refuse to write theft insurance on motor cars at all. —Editor.

Insurance companies in the last two years have stepped-up theft rates until they feel they are too high compared with other classes of insurance, yet even now they feel fortunate if at the end of a year they do not show a loss. The theft situation is such that in certain centers the companies have contemplated the complete elimination of theft insurance. The one thing that would go the farthest toward decreasing car stealing and consequently lower theft insurance rates is severe penalty meted out by a centralized court in each municipality before which every car theft case should be brought. Then, and not until then, will the thief find justice of the quantity and quality that will put fear in his heart, the motor car owner find more dollars in his pocket, and insurance companies will write theft insurance at a reasonable rate that offers a profit to them at the end of the year.

There are two classes of motor car insurance, but these have indorsements which really protect the insured in five ways. One policy covers loss of the car by fire or theft; the other is known as the liability policy. To either of these may be attached riders—one for insuring the car owner against damage done the property of others, this rider being known as the property damage indorsement, and the other for insuring the car owner for damage to his own car. The latter is known as collision indorsement and there are two indorsements coming under this head—one is known as the "$25 deductible indorsement" and the other "full coverage."

Rates Change with Car's Age

In one instance the company is liable only for that part of the damage that exceeds $25, while in the other it is liable for any claim, whether under $25 or not.

As the car gets older the premium for insuring it against theft grows smaller and that for fire, larger. It is assumed that an old car is less likely to be stolen than a new car, hence the lower rate for theft insurance, but by the same reasoning, an old car gets less care and. if we may be pardoned saying it, the owner of an old car cares less about its burning than if it were new. Of course, the older a car gets the smaller the amount of insurance one can get on it. For example, a car three years old probably will not be insured by any company in an amount in excess of 25 to 30 per cent of its value. This is on the principle that an old car insured for more than it would bring second-hand is a bad risk. In all cases the premium on a second-hand car is slightly higher than on a new car. Thus if you bought a used car, even if it is this year's model, insurance on it would cost you 10 to 15 cents a hundred more than it did the first owner.

In fixing fire insurance rates the makers of these rates base them on experience. This teaches that the older cars suffer the greatest loss from fire and the least loss from theft. In certain districts a new Ford, for example, can be insured for an amount that is optional with the company writing the insurance at $2.75 a hundred for fire and theft combined, or $1.50 a hundred for fire alone. This represents $1.25 for the theft part of the policy. Last year's Ford in the same district may be covered against theft to the extent of 60 per cent of its cost price at $1 for theft and $2.50 for fire. If the same make of car is two years old, then not more than 40 per cent of its cost price is insurable and the rate for theft is 75 cents and for fire, $3.50. This is true in proportion for cars of all prices.

Let us look for a moment upon what fire and theft insurance means to the car owner. This policy reimburses the holder for either complete or partial loss or damage to the car, its body, machinery or any equipment attached to and forming a part of the car, but it does not cover robes, coats and other wearing apparel left in the car unless indorsement covering such articles is made on the policy at the time it is written. The policy holds good while the car is within the limits of the United States—exclusive of Alaska, Hawaiian Islands and Porto Rico—and Canada while in buildings, on roads, on railroad car or other conveyance, ferry or inland steamer, or coastwise steamer between ports within the territorial limits mentioned.

Wide Latitude Given

It is evident that the car owner is given a wide latitude of travel without invalidating his policy. There are two forms of fire and theft insurance—one policy known as the non-valued form on which only an amount is payable that takes into consideration the depreciation in value of the car as the policy grows older and for which the rate is 25 cents a hundred less than the valued policy, which covers to the face of the policy if theft or total consumption by fire occurs, even if this occurs on the last day the policy is in force.

Never has the phrase, "exceptions in all cases," been more truly proven than in the insurance policy. It is well to understand your policy thoroughly, for if you only think you understand, it is likely you will find your reasoning faulty when your construction of the phraseology and that of the company underwriting the insurance take issue after a loss. Here are some of the conditions under which you cannot collect on your policy:

1—If you now have or hereafter take out a similar policy with another company, unless written permission is given.

2—If you carry passengers for compensation. Taxicab companies, of course, get insurance, but it is at a higher rate and in another form.

3—If you rent or lease your car.

4—If you assign your interest in the car, either all or in part, without written consent of the company. Policies may be transferred when the car is sold, but unless the company consents, the insurance is invalidated.

5—If your car becomes incumbered by a lien or mortgage.

Notice of loss must be made immediately in writing to the company. The company's liability on non-valued policies does not extend beyond the actual cash value of the car at the time of the loss or damage, and in no case is the liability in excess of the amount it would require to repair or replace the damaged part.

Different districts and frequently certain cities within a district will have different rates applying to fire and theft insurance. These rates are governed by the hazard. For example, theft rates are the highest in Detroit and Chicago, two cities in which the most cars are stolen each year. Thefts have reached the point where insurance men question the sanity of trying to write insurance on cars at any rate of premium.

Theft insurance on electrics is ten cents a hundred and fire alone on new models 90 cents, year-old models, $1.15, two-year-old, $1.40, three-year-old, $1.65, and older models, $1.90.

Lock Reduces Rate

By using a locking device that is approved by the underwriters a 15 per cent reduction in the rate for theft is given. A similar reduction in that part of the premium that is for fire if an approved fire extinguisher is attached to the car. It should not be assumed, however, that by affixing a lock and a fire extinguisher a 30 per cent reduction in premium rate is obtained—the total reduction for both would be about 15 per cent on the total combined rate for fire and theft.

Rate for Fire and Theft and Fire Only for Non-Valued Policy on Cars Costing from $1,400 to $2,499 in the Several Insurance Districts†

	1917		1916		1915		1914		Older	
Insure for*	Opt.		70		50		40		30	
	F&T	Fire	F&T	Fire	F&T	Fire	F&T	Fire	F&T	Fire
A	$1.75	$1.00	$2.50	$1.75	$3.00	$2.50	$4.00	$3.50	$5.00	$4.50
Insure for*	80		60		50		30		20	
B	2.50	1.75	3.00	2.25	3.50	3.00	4.50	4.00	5.50	5.00
Insure for*	80		60		50		30		20	
B1	2.25	1.50	2.75	2.00	3.25	2.75	4.25	3.75	5.25	4.75
Insure for*	Opt.		70		50		40		30	
C	2.00	1.00	2.25	1.25	2.75	2.00	3.75	3.00	4.75	4.00
Insure for*	Opt.		70		50		40		30	
D	1.50	1.00	2.00	1.50	2.75	2.25	3.25	3.00	4.00	3.75

*Not more than—
†Valued policy costs 25 cents per hundred more in each instance.

Rate for Fire and Theft and Fire Only for Non-Valued Policy on Cars Costing from $800 to $1,399 in the Several Insurance Districts†

	1917		1916		1915		1914		Older	
Insure for*	Opt.		60		40		30		20	
	F&T	Fire	F&T	Fire	F&T	Fire	F&T	Fire	F&T	Fire
A	$2.50	$1.00	$3.00	$1.75	$3.75	$2.75	$4.50	$3.75	$5.25	$4.50
Insure for*	80		50		40		20		15	
B	3.25	1.75	3.50	2.25	4.25	3.25	5.00	4.25	5.75	5.00
Insure for*	80		50		40		20		15	
B1	3.00	1.50	3.25	2.00	4.00	3.00	4.75	4.00	5.50	4.75
Insure for*	Opt.		60		40		30		30	
C	3.00	1.00	3.25	1.25	3.50	2.00	4.50	3.50	5.50	4.00
Insure for*	Opt.		60		40		30		30	
D	2.25	1.25	2.75	2.00	3.50	3.00	4.50	4.00	5.00	4.75

*Not more than—
†Valued policy costs 25 cents per hundred more in each instance.

Rate for Fire and Theft and Fire Only for Non-Valued Policy on Cars Costing $799 and Under in the Various Insurance Districts†

	1917		1916		1915		1914		Older	
Insure for*	Opt.		60		40		30		30	
	F&T	Fire	F&T	Fire	F&T	Fire	F&T	Fire	F&T	Fire
A	$3.50	$1.00	$4.00	$2.00	$4.00	$3.00	$4.75	$4.00	$5.75	$5.00
Insure for*	80		50		40		20		15	
B	4.25	1.75	4.50	2.50	4.50	3.50	5.25	4.50	6.25	5.50
Insure for*	80		50		40		20		15	
B1	4.00	1.50	4.25	2.25	4.25	3.25	5.00	4.25	6.00	5.25
Insure for*	Opt.		60		40		30		20	
C	3.75	1.00	4.00	1.25	4.25	2.00	4.75	3.50	5.75	5.00
Insure for*	Opt.		60		40		30		30	
D **	2.75	1.50	3.50	2.50	4.25	3.50	5.25	4.50	5.50	5.00
***	4.00	1.50	4.50	2.50	5.00	3.50	5.50	4.50	6.00	5.50

*Not more than—
†Valued policy costs 25 cents per hundred more in each instance.
**A distinction is made in district D and one more price classification is given.
***This represents rates on cars listing under $499.

District A—Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Maryland, District of Columbia and West Virginia.
District B—Alabama, Arkansas, Louisiana, Georgia, Florida, North Carolina, South Carolina, Tennessee.
District B1—Virginia.
District C—Ohio, Kentucky, Michigan, Indiana, Wisconsin, Illinois, Minnesota, North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, New Mexico, Colorado and Wyoming.
District D—Montana, Idaho, Nevada, Utah, Arizona, California, Oregon, Washington.

Liability insurance protects the policy holder against claims for damages on account of bodily injuries, including death resulting therefrom, due to ownership, maintenance or use of a motor car, anywhere in the United States or Canada, to the extent of $5,000 for one person and up to $10,000 for two or more. This is the minimum, it being possible to get insurance in greater amounts by paying a higher rate. When suit is brought against the holder of a liability policy the company assumes the burden of defense and pays all damages not in excess of the terms of the policy together with all costs.

Further, the holder of a liability policy is insured against loss on account of injury to or destruction of the property of others, and also is insured against loss by reason of damaging the policy holder's car. This latter is known as collision insurance and covers collision with another object, either moving or stationary, excluding, however, injury or destruction by fire from any cause. This clause also covers tires unless the total loss, including such tires resulting from such collision, exceeds $200. Under this clause each claim shall be adjusted separately and from the amount of each claim when determined $25 is deducted and the insurance company is liable only for the loss in excess of that amount. This is known as the "$25 deductible clause." This is in the form of a rider, and insurance of this kind comes at a lower rate than the "full coverage" rider which allows claims for all damages to one's car, no matter how small.

Under straight public liability policies the car owner is not protected against losses arising from damages as the result of the car being driven by a person younger than the prescribed age in the state statutes, while in a speed contest, or while being used outside the territorial limits prescribed in the policy.

The "$25 deductible" form of policy is intended for the policy holder who is careful with his car. Suppose you are backing into your garage and you crumple a fender by striking the door frame. It is likely this damage would not be in excess of $25 and you would be the goat. Knowing this, the policy holder probably would be more careful than if he had full coverage. Full coverage insurance probably is the better of the two, but it is a question of dollars and cents. The "$25 deductible" form is comparable to the reserve forces behind the first line trench; it steps in when the men in the first line find the battle getting too hot for them. If greater support is necessary, reserve forces all the way from the front line to the rear are called up and these plural reserve forces are comparable to the full coverage form of insurance.

The "$25 deductible" and the "full coverage" indorsements are exactly the same in form except as the name implies. This form of insurance indemnified the policy holder for damage to his own car from any collision except injuries or destruction caused by striking any portion of the road bed, or by striking street, steam or electric railway rails or ties. Formerly this latter exception was not found in policies of this kind, but it is now made. Neither of these forms of insurance can be had unless public liability or fire, or fire and theft insurance is carried.

Liability insurance rates vary according to locality as there are a number of factors to be considered in making such rates. Traffic congestion and the stringency of the law in some states in dealing with cases in which a motor car sometimes is classed as a deadly weapon, make car owners in those territories pay a higher rate. Notwithstanding this, you are insured against loss arising in a foreign state, even though you may enjoy the low rate at home and the touring in a locality where the rate perhaps is almost a half more than you pay.

Based on Horsepower

Public liability insurance rates are based on the N. A. C. C. horsepower rating of the car. This kind of insurance costs more in New York or Chicago than it would for the same car in Milwaukee, Kansas City, or New Orleans. It is evident that accidents are more likely to occur in the more thickly populated centers than elsewhere. Tennessee, Kentucky and Georgia liability rates are perhaps the highest to be found in any of the commonwealths. This is because of the stringency of the law in prosecuting car owners who figure in accidents where the loss of life or injury to others occur.

The greater the horsepower, the heavier the car as a rule, hence the heavier car, when moving, is looked upon as more dangerous. For example, a 16 hp. car would get a rate in Chicago for liability and property damage of $30.65 while a car of 60 hp. and over would carry a rate of $110.65.

In collision insurance the rate is based on the body type as it is evident that the damage may be greater if a limousine collides with some object than if it were a runabout. Each car is classified according to its body and rates made covering each body style for each model.

Car Shortage Situation at Detroit Acute

Liberty Loan Drive Seems to Affect Sales in Large Cities Only

DETROIT, Oct. 22—In spite of the fact that new car sales, on the whole, are below normal, dealers state that the second Liberty Loan is not the cause and that business conditions for the future look brighter. During the last week, the market on light cars has in some instances approached normal, and the medium and higher-priced cars have taken a slight upward trend. The general unsettled conditions, not the Liberty Loan, seems to have affected the buying public.

The car shortage situation here at present is very acute. Orders have been issued by the Car Service Commission at Washington specifying that all motor car equipment shall be returned either loaded or empty to or in the direction of the home road.

Several other problems are confronting the manufacturers of motor cars. Large demands on the steel and aluminum market caused by the war orders render the procuring of materials difficult and the condition of the labor market for the same reasons predicts a labor shortage. This condition has not become marked at present but doubtless will be felt by the first of the year. The war order situation has tended to increase the shipping difficulties, as war orders filled here must be transported to the seaboard and Government business naturally is given preference.

Chicago, Oct. 22—Motor car sales throughout the great agricultural belt of the Mississippi valley have improved during the last week with the farmers in several sections but are still very slow in the cities and towns. Sales are particularly dull in the large cities, where the influence of the Liberty Loan drive is felt. In some parts of the grain belt, where the farmers are holding wheat and will not consent to sell at the $2.20 Government price, trade is slow.

Studebaker reports that where special sales organization work is carried on by branches and dealers, satisfactory sales have been made, but where there is not this super-sales effort, business is slow. The farmers are not selling as rapidly as they should. These are days when it is necessary to sell cars to the farmers rather than fill orders.

F. W. Pelton, assistant sales representative of Mitchell, has just completed a circuit from Idaho Falls, Mont., to Denver, Colo., Salt Lake City, Utah, and Dallas, Tex. In Texas the entire state was well represented at the fair last week, and farmers were buying in increased quantities. The cotton crop being two weeks late has delayed buying considerably. Generally, reports from farmers in the Southwest are most encouraging.

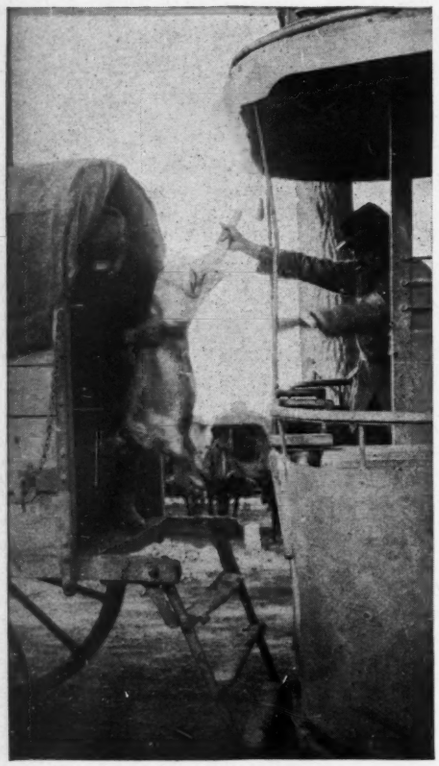
H. C. Bradfield, representing King, has just returned from a two-months' business trip on the Pacific Coast and reports retail conditions greatly improved in the sale of motor cars to farmer, although retail business in the cities, with the single exception of Seattle, which is experiencing a great boom in ship building, is very quiet. Owing to the good wheat crops around Spokane, as well as the mining activity in Idaho, country motor sales are heavy. Retail business in San Francisco has been poor, due to labor troubles, but conditions are easing up. Business in San Joaquin valley is the best it has been for some time, due to good crops and oil production. Phoenix, which is the critical point of Arizona, is experiencing good trade, due to great mining activities. Dealers have sold 2875 cars in the state between July 1 and Oct. 1.

Bankers are generally tighter with money on the entire Pacific Coast. In all Pacific Coast cities the used car situation is unfavorable. San Francisco dealers are doing more fixing up of used cars before attempting to sell them. The used car business has hurt the entire motor car business in the cities, and the coast dealers that are making good are those who are going into the country and building up the trade with the farmers.

Paris Motor Buses Feed Soldiers of France

By W. F. Bradley

MOTOR AGE'S Special Correspondent with the Armies in France



Unloading the meat from the motor bus into the camp wagon

ALL meat distribution in the French army is done by motor vehicles which are either ex-Paris motor buses or the same type of chassis built since the war. Whether they once carried passengers in Paris or have never known anything but war service, the design and construction are the same.

The motor meat buses take their supply daily from the army abattoirs and deliver it direct to the company. Years ago it was recognized that only by means of a motor fleet could an army in the field be kept supplied with fresh meat under really satisfactory conditions. With horse delivery the cattle have to be kept in close proximity to the army, have to follow their every movement and be killed while in an unsatisfactory condition. If kept farther in the rear, and only slaughtered when in prime condition, the distance is so great that the meat cannot be taken up to the troops at daily intervals.

Each motor meat bus is designed to carry 1800 kilos, or 3968 lb., suspended from hooks on two longitudinal racks. As the meat ration in the French army is 500 grammes, 1.1 lb. to a man, each bus can carry 3600 rations. Theoretically, one meat bus can carry enough meat daily for a regiment of infantry containing three batallions of 1000 men, or a total of one bus for 3000 men.

Actual figures taken from the books kept by a meat transport column in service on a portion of the French front show seven meat buses were supplying a division of three regiments, or 16,000 men. This means that one bus was furnishing 2300 men with two meat rations a day. The books show these seven buses carried 218 tons of fresh meat in a month, which works out roughly at a ton a bus a day, or a pound of meat a day for each of a little more than 2000 men.

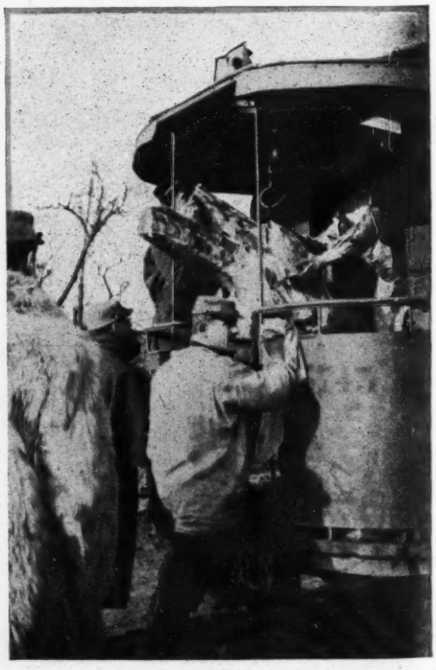
This is below the theoretical capacity of the motor buses, which is one for 3000 men. The figures are not fictitious but from the return sheets of a section on the front. The period covered was one of almost complete calm, when many men were away on leave and, in consequence, the motor buses were not working to their full capacity. The same returns show that during the French offensive on the Somme nine buses supplied 75,000 men, which gives a ratio of one bus for 8330 men, or a load of 8330 lb. a bus a day. The mileage on this occasion was 50 a day a vehicle. Although the service was maintained for some time, this represents the limit of the carrying capacity and mileage of the motor meat buses on active service. During the period of calm, when the buses were supplying only 2000 men a day, the daily mileage was only 15. This indicates that on an average the abattoirs are 7 to 8 miles behind the company quarters, though, of course, a considerably greater distance separates the abattoirs from the trenches, all food having to be cooked a few miles in the rear and carried to the men in the firing line by hand.

Fleet for Each Division

It is usual for a fleet of seven meat-carrying motor buses to be attached to each division, which roughly can be considered as 16,000 to 20,000 men. This is an absolutely normal service, which can be assured month after month, or even year after year, without a hitch. In addition to these seven there is an officer's touring car, used by the lieutenant in charge of the section, a motorcycle for the dispatch rider and a service, or repair, truck not equipped with anything more elaborate than a good set of hand tools.

Several meat-carrying sections, which had been on active service since August, 1914, or three full years, were visited on the French front last August. Without an exception these motors were in remarkably good mechanical condition. They were war-stained and had long lost their original polish under successive coats of army gray, but every mechanical organ was spotlessly clean and not a single pin or bearing had failed to receive attention and oiling at appropriate intervals. In a large measure the excellent mechanical condition of the motors is due to the fact that when these vehicles left Paris in August, 1914, they were in charge of the men who had handled them on the city streets, and these same men had been retained. Every man thus took a personal interest in his bus and made a point of honor to keep it out of the repair shops.

Details often indicate the general tendency. For instance, the engines are carried under the driver's feet, in which position there is tendency for mud and water to find its way onto the powerplant. Every driver had made a housing for his magneto, the protection being of wood, metal or leather, according to the degree of skill of the driver or the material at his disposal. Every engine was spotlessly clean; carbureter and ignition control connections free from play; there were no oil or water leaks; fan belts were adjusted correctly, and on one corner of the engine base the diver had a small can to hold kerosene for cleaning purposes. The same thoroughness was to be found in the steering and brake connections, all working parts being free from dirt and obviously oiled or greased every day. This applies to sections in



Were it not for the passenger this might be a city bus

regular service on the road the day before and ready to go out the next morning.

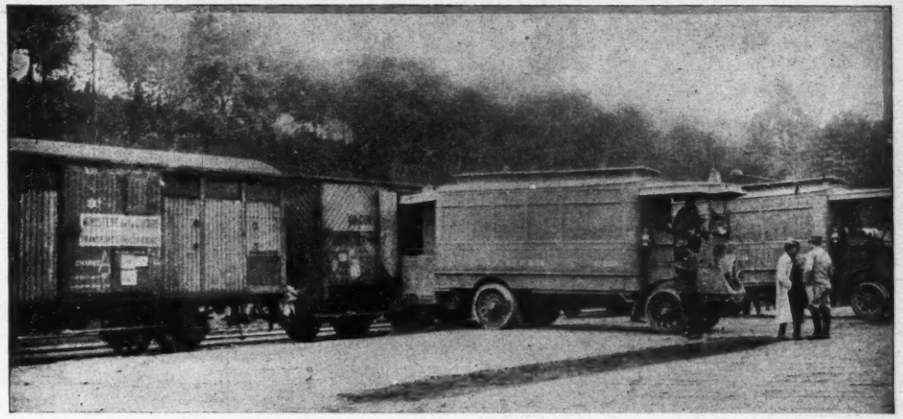
Every month or six weeks, according to military circumstances, each motor bus is taken off service and turned over to the two mechanics in charge of the section, who examine it carefully and make all running repairs. Once a year, on an average, each vehicle is sent to its groupement repair shop for complete overhauling. This mobile repair establishment, being provided with power-driven lathe, milling machine, drill presses, tire press, etc., takes down engine, gearset and rear axle, examines and repairs all the units, assembles and tests the vehicle. The solid tires are renewed at this operation, if necessary. With such a system—individual care on the part of interested drivers, a monthly examination by mechanics, and a yearly overhauling—the life of the motor bus is lengthened to such an extent that after three years' steady war service over all kind of roads the vehicles are, mechanically, as good as new.

Rear Door Necessary

Two types of meat-carrying motor buses, very similar in general design, are used on the French front. One is a De Dion-Bouton omnibus chassis and the other a Schneider. Cylinder dimensions of the former are 110 by 150 mm., approximately 4.33 by 5.9 in., and of the latter 125 by 140 mm., approximately 4.8 by 5.5 in. Both have four separate cylinders governed to 1000 and 900 r.p.m. respectively, at which the road speed is 14 m.p.h. The gearset provides three forward speeds and reverse, the final drive being by internal gears. Single and dual solid rubber tires are fitted. All the older vehicles have transformed passenger-carrying bodies. All internal fittings have been taken out and fore and aft racks with meat hooks fitted up. Those originally calculated as strong enough proved to be too weak when carrying full load over rough roads and had to be strengthened. Windows have been replaced by fine wire gauze screens.

The buses had a big rear platform, which has been retained with the addition of a solid rear door. Without a door or with gauze panels the suction at the rear caused too much dust to be drawn into the vehicle, to the detriment of the contents. The rear platform, being lower than the main frame, gives an easy entrance and facilitates loading. It also is used to carry reserve gasoline and the driver's kit. The body is 176 in. long, with a maximum width of 88 in. Under average weather conditions the fuel consumption is 45 liters a 100 kilometers, at the rate of about 5.2 miles to the American gallon. This is practically the same consumption as when operating on the streets of Paris. In city service the fuel used was either benzol or a 50 per cent mixture of benzol and alcohol. In war service straight gasoline is used. Winter service on inferior road surfaces increases the fuel consumption 20 to 30 per cent above the normal for summer duty.

In addition to the type of meat-carrying motor bus described, others are used for the smaller units, which cannot be supplied economically by a vehicle carrying nearly 4000 lb. These are 30-hp. touring car chassis fitted with twin pneumatic tires and having a special meat-carrying body. Their number is comparatively small, however.

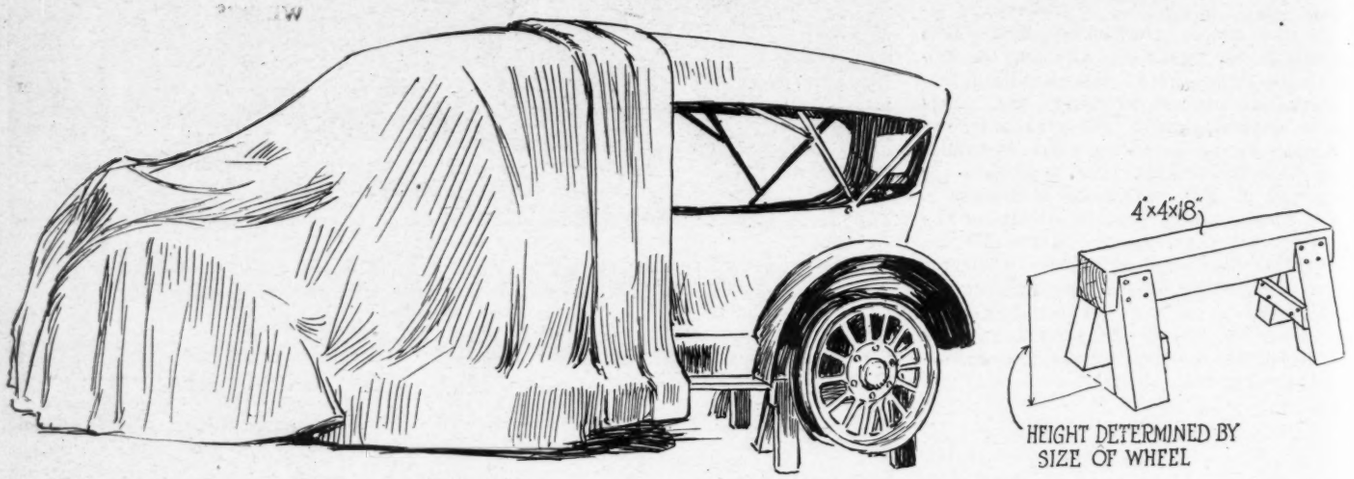


Formerly Paris buses but now making meat deliveries to the soldiers, the buses take on frozen meat from the refrigerator cars

The French soldiers have fresh meat as well as frozen, and one reason why they have it is due to the versatile bus

Every effort is made to keep the meat-carrying motor buses fresh and clean, as they are washed thoroughly whenever possible

If You Must Lay Up Your Car—Do It This Way



Make four wooden supports to go under the front and rear axles for the car to rest upon. Leave the top up and slip a cover over the car to keep out dust

By B. M. Ikert

THE time has about arrived when many motorists will be thinking of putting up their cars for the winter. People who live in the city are not troubled greatly by Boreas' icy blasts, for they have the street-cleaning departments and heavy traffic to keep the ways open. But the more unfortunate who reside in the country, or where the winter is long and the snow deep, prefer that their cars hibernate when November has slipped by.

In order that the car might be in the best of shape when it emerges from its winter quarters in the spring, there are important things that the owner must do preparatory to the final locking of the garage doors. If they are not attended to, the careless one will regret it when the spring winds blow and he finds his mount unresponsive to the throttle, finish destroyed, battery ruined, or the like.

Two Most Important

In spite of all that has been said and written about winter storage there are still owners who let their storage batteries remain in the car in an uncharged condition allowing the electrolyte to freeze, breaking the plates, jars, etc. The two most important things to look after if you have made up your mind to store your car are the storage battery and cooling system. Therefore it is well to get these in shape first.

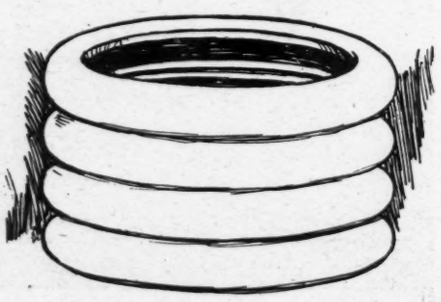
The first thing to do is to disconnect the wires at the terminals of the battery. This is a precaution to keep it from discharging, as any slight leak in the wiring would discharge the battery and it is very detrimental to let it stand in a discharged condition for any length of time in cold weather. Do not run the engine when the battery is disconnected, for you might burn out the generator if you run it on an open circuit.

If you are not going to take the battery out of the car, arrangements must be made to charge it periodically, either by running the engine and sending a current through it from the car's own generator, or by charging from an outside current supply. In any event, the job must be done about every six weeks. Before putting the car away, see that there is plenty of water submerging the plates of each battery cell. Having added the water, run the car for a mile or so to mix the newly added water with the electrolyte. The solution should be at a gravity of about 1280 to 1300 when the car is put away, which insures that it will not freeze under any conditions.

If the battery is taken from the car store it in a dry place that is free from dust. Dampness will cause corrosion on the terminals and other parts. One of the safest things the owner can do with his battery, if it is not to be used for several months, is to leave it in the hands of a battery service station where it will not be neglected. Here it can be given an occasional charge and kept in condition to resume its work in the spring.

In storing a car select a place that is well protected affording an even temperature and free from humidity. Never store a car in a barn where horses are kept; the ammonia fumes are detrimental to the finish.

Drain off all the water from the radiator and water jackets and put in a hot soda solution. Leave this in for several hours and drain it off. Then flush the whole system with clean water. To make sure that all the water gets out, run the engine for about 2 min. to dry up every particle of moisture. If the hose connections are old, take them off and stuff rags in the radiator openings and jacket flanges.



The tirs, with the tubes in them, should be piled up in this manner and covered with burlap

The old oil should not stay in the engine, so drain it off and flush out the crankcase with kerosene. Then put in a little fresh oil and run the engine a short while to insure a thin film of oil on the moving parts and cylinder walls. You might as well get all of the old oil and grease out of the transmission, universal joints, rear axle, dope cups, etc., for if you leave it until spring the lubricant may have become so gummed, that it is difficult to remove. No fresh grease need be put in until the car is taken out.

Watch Gasoline System

The gasoline system needs attention. Drain off all the fuel in the main tank and take out the supply pipe and force a length of soft wire through it to remove any foreign matter. If there is a vacuum tank on the car, take it apart and thoroughly clean the insides. After draining the carbureter bowl, put back the supply pipe.

The tires must be taken off for best results and the car supported on jacks or wood supports. A suitable horse for this is shown in the illustration and can be easily made. These supports should be placed under the car as near the spring supports as possible. Remove the tires from the rims and wash them with water. Vulcanize all bad spots and fill the small holes with tire putty. Give all the tires a good coating of talc or mica. One of the best ways to care for the tubes is to put them in the tires inflating them just enough to round them out. Place plenty of mica or talc on the tubes also. Place the tires on top of each other and cover them with burlap or something similar. As far as possible have the room where the tires are stored at about 50 deg. temperature and where they will not

be exposed to strong light, or the action of oil. If the rims are rusty, clean and give them a coat of rim paint.

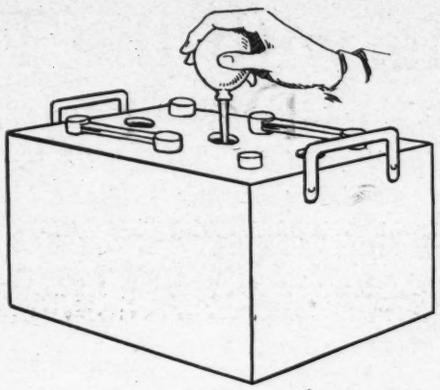
All accumulations of mud, dust, etc., should be removed by washing the car with soap and water. Never put the car away without doing this; the varnish will suffer irreparable damage. After thoroughly washing, the water should be dried off with a soft sponge and then the whole polished with a soft chamois leather. Particular attention should be given to corners and crevices where water might lodge. Bright sunlight causes varnish to crack and deadens the gloss, therefore, fit a cloth cover over the whole car when it is put away. This also keeps out dust.

Smooth Top Out

Standing for a long period in a folded condition, the top is apt to get creased and damaged. So when storing the car, put it up, thus allowing it to remain in a smooth shape. Dust the top well before covering it up and if it is of leather give it a coat of boiled linseed oil. The outside of a pantasote top is best cleaned with lukewarm water and castile soap. Put the side curtains on also, after they have been cleaned. This will give them a chance to straighten out and help keep the upholstery clean.

Sponge off the upholstery with a solution of one part of pure ammonia to nine parts of water, then rinse with clean water. This will remove the dirt. After it is dry, buff it with a soft woolen rag. A good leather dressing properly applied at this time will also add to the appearance of the job. Do not use gasoline for cleaning leather trimming.

All the nickel-plated parts, such as the lamp rims, steering wheel spider, dash instruments, levers, etc., should be cleaned and polished with a metal polish. A thin coat of vaseline is then applied over the bright surfaces, to keep them from getting dull or rusting. Do the same with exposed parts of the powerplant, such as the magneto coupling, spark and throttle levers, etc. Roll up the rubber floor mat and after cleaning it, put it with the tires. The car is now in good shape for putting away and the only thing left to do is to slip the cover over it, after having first protected the upholstery with covers of some kind.



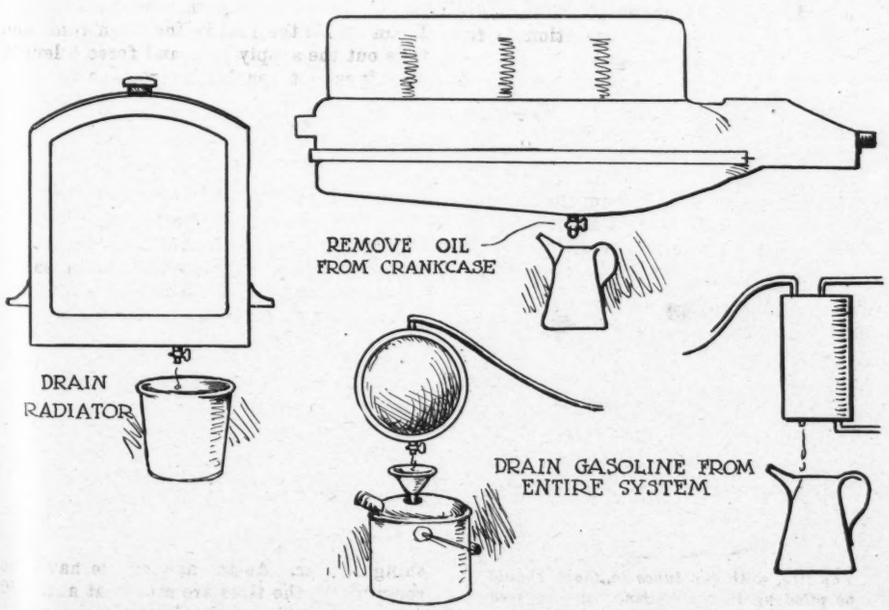
It is just as important to add water to the battery in winter as in summer, but it need not be done so often

NEW APPERSON READY SOON

Kokomo, Ind., Oct. 23—A new Apperson eight, which varies somewhat from the preceding model, will make its appearance soon. Most of the changes are refinements in engine and in body line. Apperson claims for its engine that it is different from any other eight now used. It uses but one camshaft and two cam gears. Using but one camshaft, whereas in usual construction there are two, eliminates many movable parts. Valve caps and rod arms are inclosed, yet are so covered as to be easily accessible. The new models will be offered in seven-passenger and chummy roadster bodies and this holds good both for the eight and six-cylinder types.

WOLVERINE NOW ON EXHIBIT

Kalamazoo, Mich., Oct. 19—The Wolverine Motor Car Co. has increased its capitalization to $250,000. The first models of the Wolverine Speedway Special now are being exhibited. This car has a wheelbase of 117 in., weighs 2340 lb., and, it is stated, is capable of developing a speed of 100 m.p.h. Aluminum enters largely into the construction. It is planned to start active production in November, and material is on hand for manufacturing 600 cars during the coming year.



The oil, gasoline and water systems, especially the latter, must be drained. If there is a vacuum tank on the car it also should be drained and taken apart for cleansing

THE WEEK'S INCREASES

Springfield, Ohio, Oct. 19—The prices of all Wescott cars will advance Oct. 31 as follows: Seven-passenger and five-passenger touring cars were $1,790, now $1,940; four-passenger touring roadster, was $1,790, now $1,890; seven-passenger and five-passenger convertible sedan, were $2,690, now $2,790; four-passenger convertible coupe, was $2,690, now $2,790.

Chicago, Oct. 20—Oct. 25 the price of the Stephens Salient Six will be increased from $1,385 to $1,485.

Detroit, Oct. 23—Chalmers has increased prices, effective Nov. 1, on the five-passenger touring car and roadster to $1,365 and the seven-passenger touring car to $1,450. The former prices were $1,250 and $1,350 respectively, without the war tax of $30 on each. The new prices include the war tax and are net to the purchaser, f. o. b. Detroit. Prices on all other models remain the same.

Detroit, Oct. 22—An advance of $50 has been made on the open model Dodge Brothers' cars and $85 on the inclosed model, effective Nov. 1. The new prices are: Roadster and touring car, $845; sedan and coupe, $1,150.

Detroit, Oct. 22—The Maxwell Motor Co. has increased the prices of the Maxwell truck for 1918, has added a new body style and made two slight mechanical changes. The prices are now $865 for the chassis, and $995 for the screened express body. The Maxwell truck body line is now standardized so that it is possible to build up practically any kind of a body by means of the combination box and stake types whereby the stakes are set up inside the flare on the box body. The complete line of bodies now embraces four types by means of this standardized form of design, the express canopy at $995; combination box, $915; combination box stake at $950; and the stake gate body at $955. The chassis with cab and windshield is $900.

The mechanical changes are slight, being merely an increased volume of cooling area and a change in the reduction on low gear. This has been raised to 34 to 1, whereas it was formerly 21 to 1. The new reduction allows of considerable more power application for handling heavy loads in hilly country.

TO MAKE DUPLEX-DRIVE TRUCK

Eau Claire, Wis., Oct. 20—A duplex-drive motor truck and tractor, designed by Jonas Bergh, Eau Claire, Wis., will be manufactured by the New Way Machinery Co. of that city, in addition to the Wege combination, truck, tractor and concrete mixer, now in production. The company recently was incorporated with $60,000 capital by Ernest Wege, Minneapolis, Minn., and has established a shop at Eau Claire.

Trading with the Enemy

MOTOR AGE Reprints Herewith an Extract from a Speech by Secretary of Commerce Redfield on the Trading with the Enemy Act, Delivered before a Conference of Business Paper Editors. It Is Reprinted without Apology. These Words Are Good Reading for All Motorists.—Editor.

"COMMERCE is used as a war weapon in two ways. First, it is used to provide the nations associated with us in the war with the means of warfare; and, second, it is used to see that our enemies do not by direction or indirection obtain anything that comes from our shores which we can prevent. There is a third element in it, the element of conservation, which has to do not with economy of money, as I think is too often thought, but with the saving of that of which we have but little to the use that must be made of it in the war and the using, on the other hand, of that of which we have abundance in its place.

"Now, the acts affecting commerce are those controlling the large acts, the serious ones, those controlling exports. Quite as important, but not so much talked about is that phase of Trading with the Enemy Act which controls imports, and then the Trading with the Enemy Act itself.

"The situation we face is something like this: if our industrial power can be unified, if our agricultural power can be unified, if our financial power can be unified, if our man power can be mobilized, then there is but one end to this thing, for in those respects we alone are stronger than any two of the nations engaged in war. If we can get ourselves together and pull as a team, there is only one result, and the laws I speak of are a part of that process.

We are exerting the greatest effort in the history of the land. I cannot give details of that exertion in all its forms, but enough has been said to you in public of what is being done in the way of building merchant vessels to have you know that no such effort in that single direction has ever been exerted by any people anywhere.

Enormous Naval Construction

"On top of that is the enormous naval construction, of which I can only say that it includes vessels by hundreds. On top of that is the enormous demand for railway apparatus and appliances. We bid fair to make up by construction of American railways in Europe for what we failed to construct in the United States in the last few years.

"I wonder how many of you would have dared believe four years ago that we would have American railways running in Europe, numbering their locomotives by hundreds and their cars by thousands. But such is the fact. If you want to try the possibilities of buying some railroad apparatus, try and get a locomotive delivered early and see where you come out. That whole great industry, the whole great steel industry of the country is itself unified on this job.

"Now, we are not certain yet that we are going to have, even with all our power, enough, first, for ourselves; second, for our associates; and, third, anything for the neutrals to whom it seems to be safe to sell any goods in these days. That has got to be determined yet.

"One thing we are mighty certain of, the margin is at least so near that it doesn't seem wise to sell anything except to carefully safeguarded neutrals, and we must be sure that no American boys are killed for lack of what our industries can do, and that our Allies do not suffer for lack of what they do.

"And consequently the principle which lies behind the restriction of exports is the principle of conservation; that our industry shall be so controlled as regards their exports that after our own needs are satisfied, what we sell shall be used to support our associates, and what we have left over shall go as freely as we may to places where it is safe to have it go and to persons who use it wisely.

"Now, there is in the bill, however, a very original, as far as I know a novel clause—I am not sure whether anything like it exists in Great Britain or not; I have never heard of it certainly, anyhow; but certainly something which is entirely novel to our law, our practice, and that is the creation of the alien property custodian.

"I need hardly say to you that there is a very considerable amount of property belonging to enemies in this country, money which has been invested by Germans or Austrians or others before the war. A very considerable body of stock in a good many corporations is so held.

"This clause provides a custodian, an official custodian, to whom all interest, dividends, etc., belonging to such enemies or enemy allies can be paid.

"In the original bill it had to be used for certain purposes, but in the present form it may be used to purchase Government bonds, so that in that way the property of enemies may be used to finance the war against them, with the understanding, which is a very interesting one and one which is the act of a good sport like Uncle Sam, that this property is not confiscated, but it is by the alien property custodian to be preserved and after the war Congress may, at its own will, dispose of it as it sees fit; which means, of course, that it is quite possible, I think it quite probable, that it will be returned after the war intact to its original enemy owners, we having had the use of it meanwhile for our own purposes.

"It is deliberately left open in the bill for an American citizen to obtain, providing Germany shall reciprocate, patents in an enemy country during the war and for our enemies to obtain patents in this country during the war, and it is also provided that any American manufacturer or industry may apply to the President or to the War Trades Bureau, where it has been placed by the direction of the President, for a license to use, during the war, any patent belonging to an enemy or to an ally enemy existing and valid in this country.

"He may use that patent if he secures a license for a very small fee, limited, I think, to $100, but he must pay 5 per cent of the value of the articles which he makes under that patent into the alien patent custodian.

May Sue for Royalties

"At the end of the war the law provides that the foreign owner may sue in our courts within a year for a royalty for the use of that patent, and if he recovers, the law provides, however, that any defense which would ordinarily be made against such a suit shall be valid. In that case, if he should recover, then this 5 per cent fund that he has paid in, so far as it goes, shall be used to pay the judgment. And if he does not recover, or if during the year he does not bring suit, then the 5 per cent is to be refunded to the American user.

"Now, that is a principle of a great deal of value and already in one important case has been brought to my attention by parties desiring to avail themselves of important patents now existing in this country.

"I think I have covered the substance of the measure; I am not much concerned with its letter. The letter of a law has always to look rather firm, not to say severe or stern. The spirit of law is another and a very different thing. It has been placed so far as its administration lies in the hands of the War Trades Board.

"That Board is composed of a representative of the Department of State, Department of the Treasury, Department of Commerce, the United States Shipping Board, the Department of Agriculture —I think one other; there are six, as I recall. It is the Export Administrative Board under another name, with the addition of a representative of the Treasury and of the Shipping Board."

To the Land of the Stately Palms

The destination was a place where palms were silhouetted against the heavens

By Motor from Northern Illinois to Southern Florida—the Roads

By Glen Mead Royston

IT was on the morning of an early autumn day that we, my mother and I, left home.

The day before had been very pleasant, and we woke up with hopes of a like day to start our trip, but when we looked out, those hopes were taken away. It was raining. Not a very promising way to start a 1500-mile journey. With hopes that the old saying, "Rain before 7, clear off before 11," would hold good, we decided to make a stab at it, so we made our final adieus and pulled out, on our way to the land of sunshine and stately palms.

But the day did not clear up before 11; in fact, it rained and rained, all day long, so that when we arrived at Rensselaer, Ind., at 5:05 p. m., we decided to stop there for the night. We had planned only to make 100 a day, and our mileage was 116, so we had done all, and more, than we had intended.

The second day was even worse than the first, both in regard to the weather and roads, for the rain of the day before had made the roads in some places almost impassable. It had turned colder, was still raining, and a wind of about 50 miles an hour blew all day. Before noon the rain turned, first to sleet, then to hail and then to snow, and it snowed the rest of the day. This day we drove through wind, sleet, rain, snow, hail and mud. Through it all the good old Hudson hummed its tune of perfect contentment and never once paused to question the reason why. I think that this was, excepting one or two others, our most tiresome day, and we arrived at Crawfordsville, Ind., at 3 p. m. This was 198 miles from home, not quite our 100 a day.

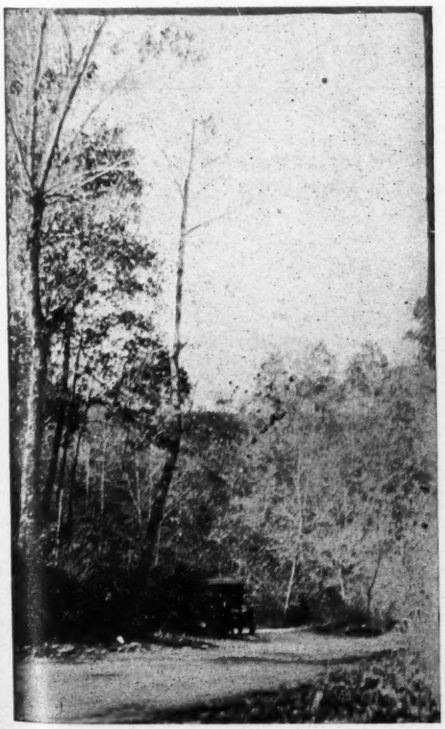
Before leaving home we had decided to spend Sunday night in Louisville, Ky., and we did. Saturday we only covered 79 miles, as both the bad roads and weather held out, and the roads were becoming more hilly. Sunday we went from Bloomington to Louisville, and at 3:45 p. m. Sunday we crossed the Ohio river into Louisville.

The road and scenery into and out of Louisville is beautiful, and for miles we rolled along, enjoying every minute of the day.

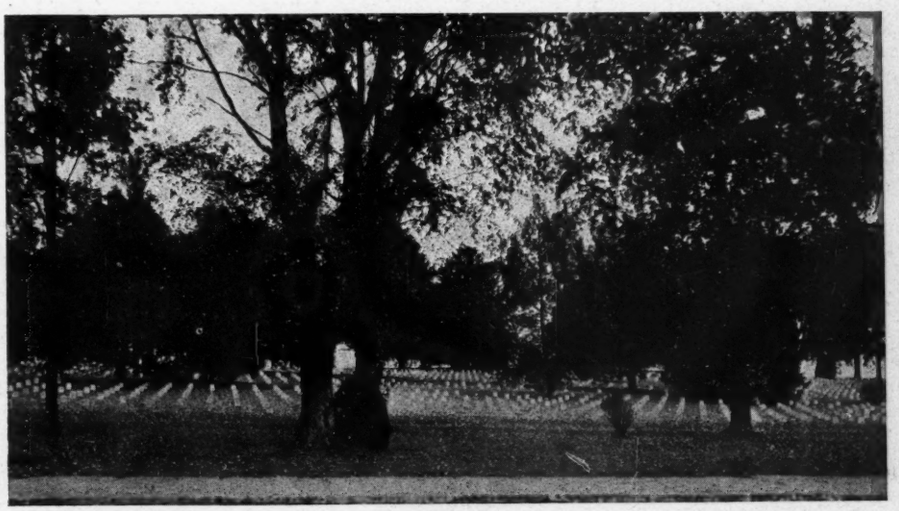
Very soon after leaving Cave City, Ky., the next day we came to the old Telford road, built in Andrew Jackson's time for use of the troops.

We had been advised that it would be best for us to go from Nashville to Chattanooga by way of Huntsville, Ala., and thus avoid the mountains to a good extent, so the next night we were able to be 4 miles ahead of our 100-mile-a-day schedule.

The road from Huntsville to Bridgeport is one mountain after another, and for every straight mile as the crow flies one must go miles and miles, winding around and around, up and down, until one is dizzy. We had thought to make Jasper, Tenn., that day but pulled into Bridgeport, Ala., at 5:45 p. m.



This beautiful drive out of Louisville, Ky., gives enjoyment every minute



Near Louisville is the National cemetery, where stones spot the grass like white clover would if it grew according to straight lines

Much of the cotton remains in the fields until late and lends charm to the old cabins, often deserted, that live along the road

A cotton plant and something of a curiosity outside of its community

The next day, Friday, we arrived at Chattanooga, Tenn., at just noon after a beautiful drive for miles along the Tennessee river, and for the rest of the day we took a much needed rest. Saturday was spent in Chattanooga. In the morning I gave the car a once-over to see that everything was shipshape, and that afternoon I drove to the top of Lookout Mountain, 1700 ft. in the air. The view from Lookout Mountain is awe-inspiring, and I cannot conceive of a more beautiful scene than Chattanooga and the Tennessee river from there.

On the Battlefields

Sunday we passed through the Chickamauga Battlefield, where so many bloody battles of the Civil War were fought and which is now a magnificent park, to Atlanta, Ga. From Atlanta to Macon we drove over the same road General Sherman took in his famous march to the sea. From Macon to Waycross, a distance of 178 miles, we had the best road that we had at any time during our trip, and Georgia surely should get a medal for the work which has been done on this road.

From Waycross to Jacksonville much must be done to make the road better. It is sand, sand, nothing but sand, and driving through the sand ruts, which twist and wind, back and forth, across the road, will make the strongest man tired. Even the scenery is tiresome, nothing but pine trees, boxed for turpentine, for miles and miles, as far as the eye can see in all directions. Still, at that we made fairly good time, and after stopping an hour at Jacksonville we continued on our way to St. Augustine.

Counting out the days we were not on the road, we took just a little more than 12 days to the trip. Had I had anyone to relieve me in driving no doubt the trip could have been made in much less time.

A word about the expense for the trip. The hotel and eating expenses can be as much as one feels they can afford, but they will average about $3 a day a person. On the trip we used 124 gals. of gasoline, 34 qts. oil, paid seventeen tolls—toll roads through the state of Tennessee—and three ferries and had miscellaneous expenses, such as having car washed, tire repairs and so on. The total cost for the car was $49.25.

All in all the trip was a success, and mother and I always will look back on it with pleasure. We hope and feel sure that this year so much will have been done to the roads as to make the trip even more enjoyable, and we intend to make the trip again this year.

The car, the writer and his mother, who made the trip

Route Information

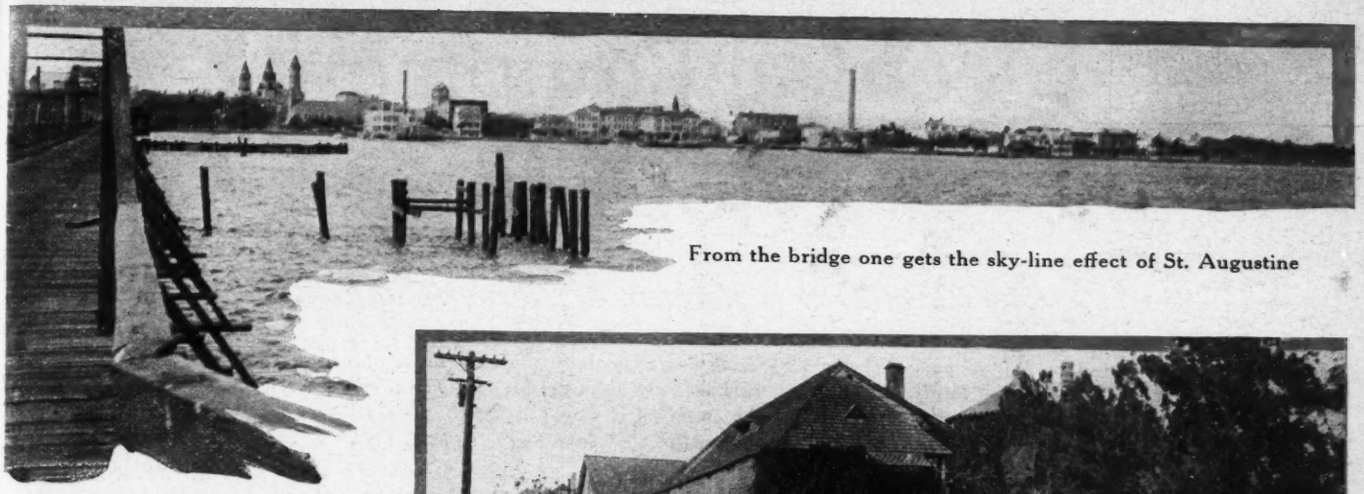
MOTOR AGE outlines route itineraries for its readers by letter. Each week not more than a few of the routes asked for are published, these being of more general interest. In asking MOTOR AGE for routes, write your name and address distinctly on a return envelope.

Texarkana, Ark.—Editor MOTOR AGE—What is the best route and what are the conditions of the roads between this city and El Reno?—Harry Firmin.

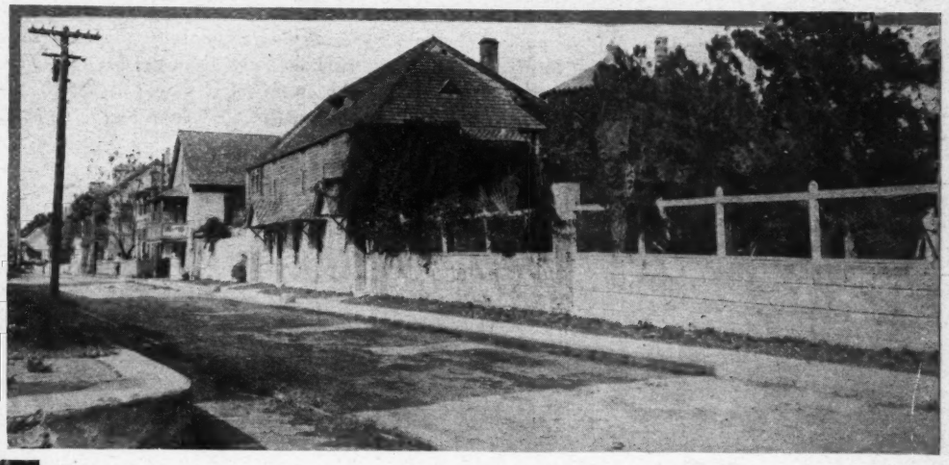
From Texarkana drive to New Boston, Tex., DeKalb, Oak Grove, Annona, Clarksville, Detroit, Blossom, Paris, Brookston, Petty, Honey Grove, Bonham, Whitewright, Vandalia, Anna, Van Alstyne, Howe, Sherman, Denison, Colbert, Okla., Calera, Durant, Milburn, Tishomingo, Drake, Millcreek, Sulphur, West Sulphur, Davis, Wynnewood, Pauls Valley, Maysville, Purcell, Lexington, Noble, Norman, Moore, Oklahoma City, Packingtown, Tukon, El Reno.

The roads you encounter are all of natural dirt and their condition depends on local weather conditions. We would not advise this trip right after heavy rains.

Vol. 7 of the Automobile Blue Books, published at 910 South Michigan avenue, Chicago, contains complete running directions.

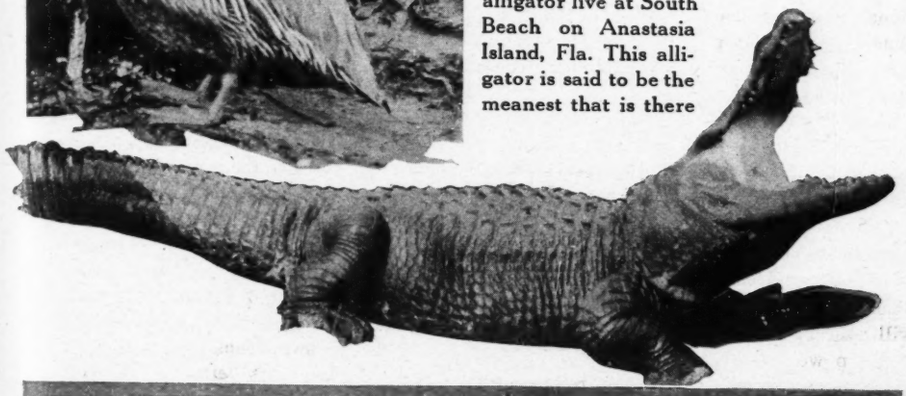


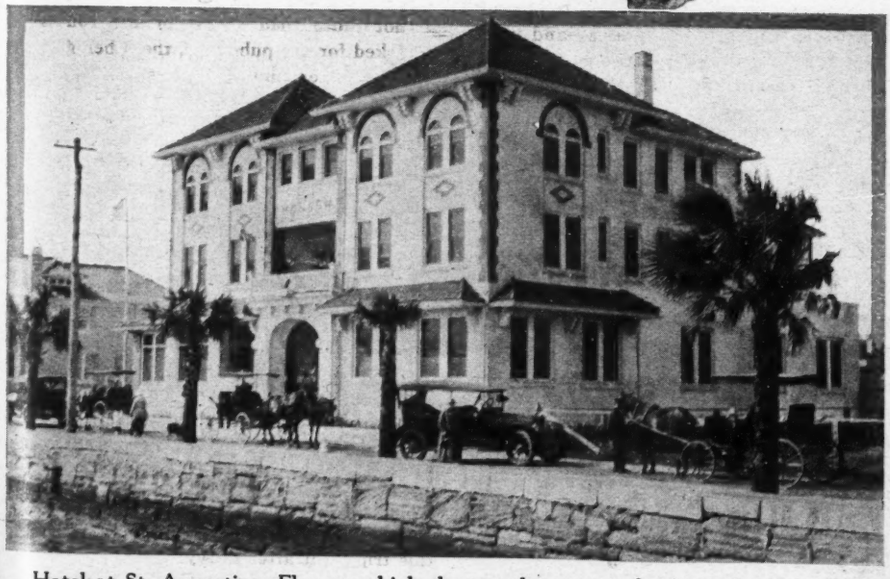
From the bridge one gets the sky-line effect of St. Augustine



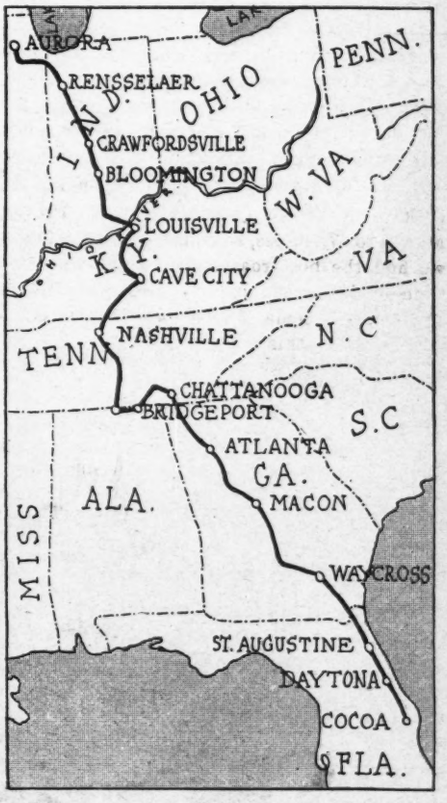
The oldest house in the United States at St. Augustine, Fla.

This pelican and this alligator live at South Beach on Anastasia Island, Fla. This alligator is said to be the meanest that is there

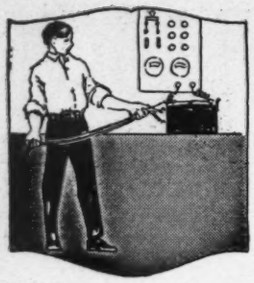




Hotel at St. Augustine, Fla., at which the travelers stopped. It is characteristic of the state in architecture and plant life



The route followed in search of the land of the stately palms



Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the sixty-sixth installment of a weekly series of articles begun in MOTOR AGE *issue of June 29, 1916, designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the U. P. C. Book Co., Inc., New York, in a size to fit the pocket conveniently.*

The fundamentals of electrical circuits of the motor car were explained through their analogy to water systems, and the relations of current pressure and resistance were brought out. This was followed by an explanation of series and multiple circuits, how electricity is made to do work in lighting, starting, signalling, etc. Calculating the capacity of a battery for starting and lighting and the cost of charging storage batteries and determining the torque a starting motor must develop were explained. Action of primary batteries and dry cells was considered. A section was devoted to the makeup and action of lead and Edison storage batteries, and another to the care of lead batteries in service and the best methods of charging them. Magnets and electromagnetism then were considered, and the principles of generators and motors explained. A section on generator output was followed by one on the purpose and operation of the cutout. Electric motors and engine and motor connections then were considered. Ignition was taken up next.

Part XLVI—Battery Ignition Systems

THE earlier ignition systems manufactured by the Dayton Engineering Laboratories Co. operate on the open-circuit principle. A top view of one of the interrupters is shown in Fig. 364, and its operation is as follows: The movable contact is carried on a straight spring blade C, to which there is attached a bent spring blade B, held against the surface of the cam by the coiled spring E. The spring C is placed, when properly adjusted, under a slight tension due to the action of the springs B and E, and the movable contact on the spring C is held away from the stationary contact D. When the projection on the spring B strikes the projections on the cam, the end of C moves toward the stationary contact and the contacts close. As the projection on the spring B passes the hump on the cam, the action of the spring E draws B back suddenly and the end of B strikes C and the contacts are quickly opened. The duration of the contact, of course, will depend upon the speed of the cam, which, of course, depends upon the speed of the engine.

In the later models of the battery ignition systems manufactured by the Dayton Engineering Laboratories Co. the closed-circuit principle is employed. A top view of the interrupter is shown in Fig. 365, and its operation is as follows: The arm B carries the movable contact D, which is normally in contact with the contact C. A piece filer is mounted on the arm B which bears against the surface of the cam and is lifted by the projections of the cam against a small flat spring which is held by the inner wall of the housing. The stationary contact C is adjusted by the screw and held in place by the lock nut N. These contacts should be so adjusted that when the filer block mounted on B is on top of one of the humps on the cam, the contacts should open sufficiently to allow the gage on the wrench, provided with the system, to close the gap. The method of using the gage in adjusting the contact points is shown in Fig. 366.

The timing of the spark may be adjusted by moving the cam A with respect to the shaft upon which it is mounted, which is done by loosening a screw in the end of the shaft and again tightening it after the cam has been moved the desired amount. Turning the cam in a clockwise direction, or toward the right, advances the time of ignition, and counter-clockwise, or to the left, retards it.

The Resistance Unit Function

Should the ignition switch be left closed when the driver leaves the car, there is a likelihood of the contacts on the interrupter being

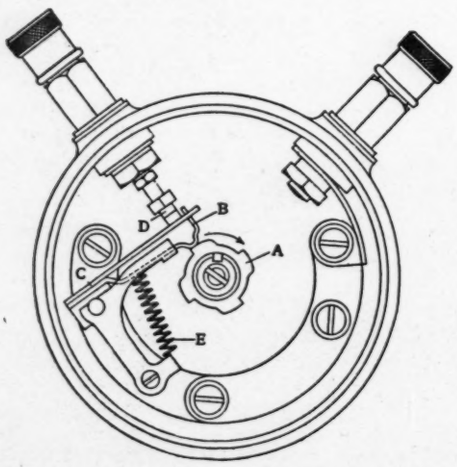


Fig. 364—Top view of Delco open-circuit type of interrupter

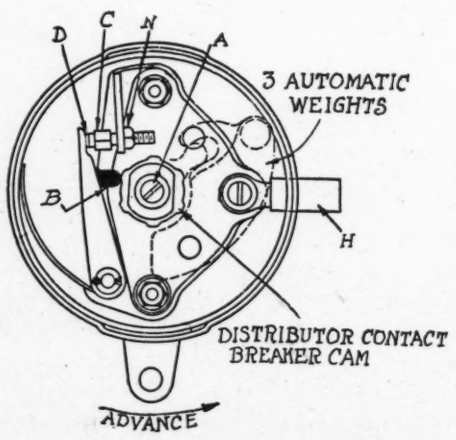


Fig. 365—Top view of Delco closed-circuit type of interrupter

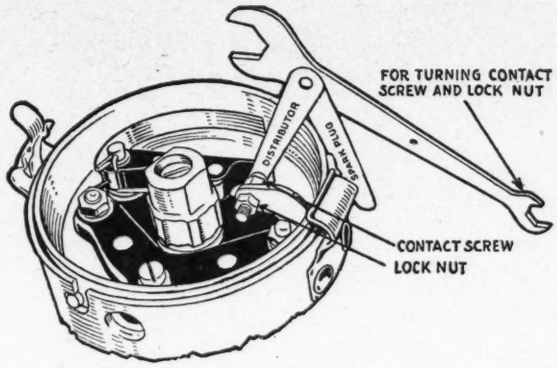


Fig. 365—Method of using gage in adjusting contact points of Delco interrupter

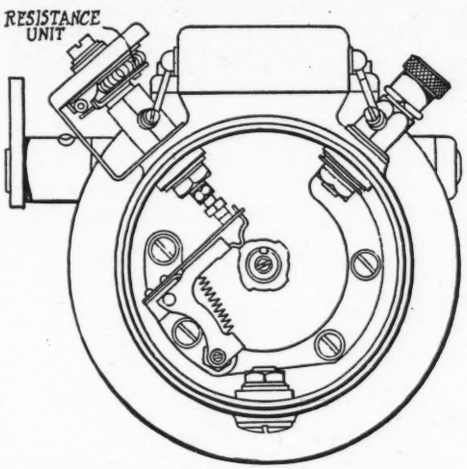


Fig. 367—Delco interrupter with resistance unit

left in the closed position, and if these contacts are closed, the battery will continue to discharge, which will result in its being completely exhausted if the discharge is allowed to continue for a sufficient time. To prevent this waste of energy and possible damage to the coil, a resistance has been introduced into the primary circuit. This resistance unit is shown in the upper left hand corner of Fig. 367. The unit consists of a small open coil of high resistance

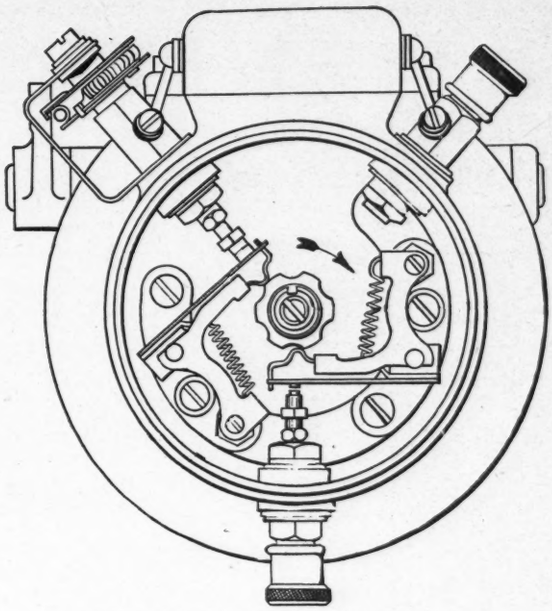


Fig. 368—Delco dual type of interrupter

wire wound upon a porcelain spool. All the current passes through this resistance unit, but owing to the extremely short period it continues between interruptions, due to the opening of the contact points, the resistance wire remains fairly cool. When the ignition switch is left closed and the engine stops with the interrupter contacts closed, the current is then continuous and of greater effective value, and it causes the resistance wire to become heated to a red heat in a very short time. At this high temperature the resistance of the wire is much greater than at a lower temperature, so that it does not permit as much current to pass through the primary winding of the coil as would pass if the resistance of the wire remained unchanged.

Delco Interrupter

A dual type of interrupter is shown in Fig. 368. It has two independent sets of interrupter contacts, one for the battery and one for the magneto. The operation of this interrupter is the same as the other types except an additional set of contacts is provided.

M. & A. M. Meets at Cleveland

CLEVELAND, Ohio, Oct. 19—The Motor and Accessory Manufacturers, Inc., which is meeting here, is much preplexed over section three of the food bill. According to the interpretation of Attorney Sidney S. Meyers any member of a board or committee at Washington who advises or takes part in the award of contracts for the purchase of products in which he has even a stockholder's interest is liable to a fine of $10,000, and five years in jail.

A strict application of this rule would eliminate from active work many M. & A. M. members, who have been devoting much of their time to Government work. The members do not know what course of action to take.

That more cars are to be delivered over the highways, instead of by freight was indicated by the associations' action in approving the completion of a section of the Dixie highway in Kentucky, which connects good roads north and south of this poor section. Chairman Roy D. Chapin of the good roads committee of the N. A. C. C. was given permission to solicit the support of individual M. & A. M. members for this project.

Attorney Meyers stated that the bogus parts question and the Morrison bill were outside the jurisdiction of the association and that any bogus parts questions must be settled by members individually. The association invested $25,000 in the Second Liberty Loan.

DETROITER MAY REORGANIZE

Detroit, Oct. 23—Special telegram—The Security Trust Co. is holding the Detroiter Motor Car Co. as trustee for time being. An inventory is being made, and the company will be held either until new capital is obtained and reorganization made or until it is sold to satisfy stockholders. Production is being continued in a limited way, about twelve cars being made in last two weeks. The service organization, however, is being maintained to hold good will and permit reorganization.

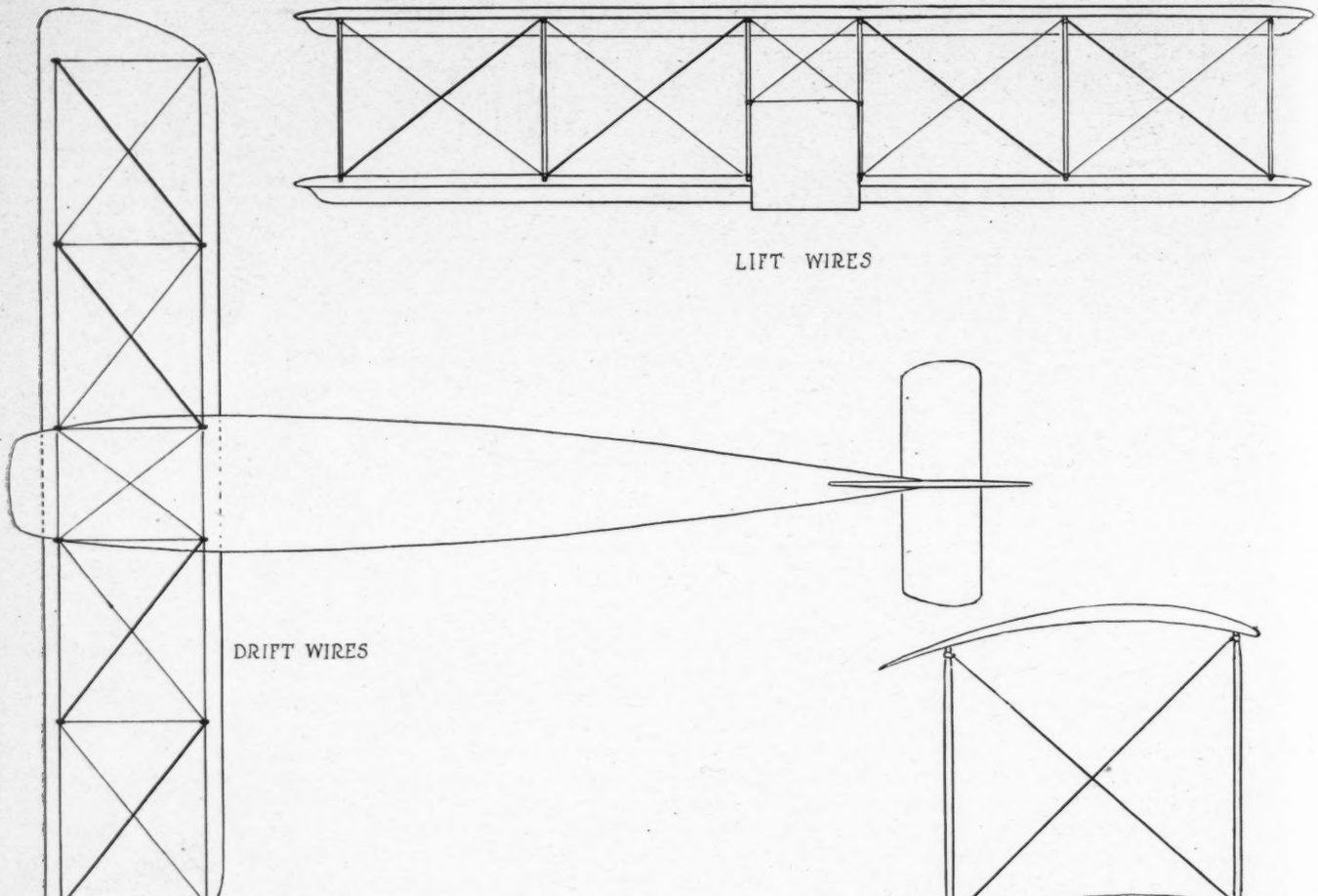
HARROUN GETS MORE CASH

Detroit, Oct. 23—Special telegram—The Harroun Motor Corp. has obtained in cash $650,000 from Kansas City interests, which amount is being used for production purposes and which brings the liquid assets of the company, including cash in bank and inventory, up to $1,000,000. The value of the plant, real estate, machinery, etc., amounts to $1,250,000, or a total investment of $2,225,000. With this new capital it is expected to have a production of twenty-five cars a day within thirty days. The company has been in production since July, manufacturing complete cars which have been delivered to dealers and distributors and which cars have been under test for three and four months. For some time the factory has been building engines to be ready for its production schedule, which is now to be put under way.

WHAT CANADIAN FORD EARNS

Montreal, Can., Oct. 19—The Canadian Ford Motor Company, Ford, Ont., profits were $2,322,646 on its capital stock of $7,000,000 in the fiscal year ending July 31. This profit, added to a balance of $1,039,122 at the end of the preceding fiscal year and a rebate of $18,813 on 1915 taxes, left a balance for the year of $2,445,139 after payment of $935,443 for 1916 and 1917 war taxes.

A. B. C. of Aviation



Purpose of Bracing Wires on Biplanes

THE bracing wires used in an ordinary biplane serve different purposes. Biplane wings are trussed together horizontally, vertically and transversely, making a box-girder construction. Owing to the functions of the wings of an airplane, each set of truss wires has a definite duty to perform. Essentially it is the duty of the wings to lift the airplane as a whole and as most of the weight of the machine is confined in the body, the question is how to transmit the lift of the wings to it.

When an airplane is traveling through the air, the lifting force exerted on the wings tends to force them upward, while the weight of the body tends to force them downward. This results in the wings trying to fold upward from the tips inward. The heavy lines shown in the front elevation in the accompanying illustration prevent this and are called lift-wires. Under these conditions there is no load on the opposite diagonal wires. They come into play only when the machine alights and are consequently called landing wires.

Not only do the wings have a tendency to fold upward, but backward as well, when the machine is in flight. To prevent the rear spar from bending back, drift-wires are used. They are shown by the heavy lines in the top view of the biplane. The wires which cross these are called anti-drift wires and come into play when the forward progress of the machine is suddenly arrested, as when making a landing on rough ground. On some machines it is customary to fit external drift wires going to some point forward on the machine and anti-drift wires running to the rear.

In order that the upper and lower planes may be held parallel incidence wires are used, as shown by the side view in the illustration. These wires also serve to hold the wings in correct relation with the rest of the machine.

HIGHWAYS TO MEET TOGETHER

Seattle, Wash., Oct. 19—A joint meeting of the Interstate Highway Association and the Idaho State Evergreen Highway Association will be held at Lewiston, Idaho, Nov. 7-8. Delegates are expected from British Columbia, Washington, Oregon, Idaho and Montana. Governors Stewart, Withycombe, Alexander and Lister have accepted invitations to attend, and the highway commissioners and state engineers of Montana, Idaho and Washington will be present. Both organizations are working to promote the improvement of the Evergreen highway from the East and Southwest into the Pacific Northwest.

TO MOVE CARDELL TRACTOR

Lansing, Mich., Oct. 19—The Cardell Tractor Co., formerly of St. Louis, Mo., in which R. E. Olds is interested, will be moved to Oldsmar, Fla. This company was organized by the Cardell Co. of St. Louis, Reo distributor, and the change of location was made to permit subsequent expansion.

Red Cross motor corps formed by prominent society women of Washington under the leadership of Mrs. J. Borden Harriman, who is shown in the center of the group

Motor Activities Among Women

Efforts of Americans to Do Their Part—Great Food Drive

THE society women of Washington, D. C. —provided it be correct to call them such now that they give the majority of their time to active war preparedness work —have an organization under the leadership of Mrs. J. Borden Harriman that is on the job all the time. This is the motor ambulance corps that was formed at Washington soon after the declaration of war. The corps was organized to handle motor ambulances under the supervision of the American National Red Cross. No women who had not had at least a year's experience in driving a car was accepted for membership, but an enrollment of sixty was recorded during the first few days the list was open.

The women were drilled rigidly even in the early days of the corps. Big army trucks such as those used on the Mexican border were used, and some twenty-five women turned out for the first drill. In addition the mechanical side of the motor car was taught by competent instructors. Once the first recruits became versed in certain of the rudiments of driving they began to teach the newer recruits.

Drilled from Start

The women of the corps wear a distinctive gray uniform not unlike those of the British aviators, gray cloth coat in Russian blouse effect, heavy leather belt, trousers, high riding boots and tight-fitting boat-shaped hat with a red cross on the peak.

Another form of motor activity at the Capital is a motor truck kitchen unit as a branch of the Red Cross refreshment corps. The women of the Washington branch organized this unit early, also, and are prepared to serve hot coffee and sandwiches to soldiers passing through the city. The motor kitchen is supplemented by push carts on which the food is loaded from the kitchen outside the station and taken down the platforms to the soldiers when needed.

The Washington motor units went to New York to take part in the great Red Cross parade in which thousands marched.

Help Save the Food

UNCLE SAM is going to make a drive next week to enlist 100,000,000 persons under his Food Administration, which is the same as saying your Food Administration. Through the press, the churches, the fraternal orders, the women's organizations, the farmers and the business men he seeks your signature on the dotted lines of the food pledge.

As a member of the United States Food Administration you can aid directly the Food Administration and help win the war by:

(1) Eating as little wheat bread or other wheat products as circumstances permit, and, if possible, not more than once daily;

(2) Eating meat—beef, mutton or pork —not oftener than once a day;

(3) Economizing in the use of butter and discouraging the excessive use of other fats;

(4) Cutting your daily allowance of sugar in tea or coffee, and of sweet drinks, candy and in other ways helping to lessen the consumption of sugar;

(5) Eating more corn, rye, vegetables, fruit, fish and poultry in place of wheat and meat;

(6) Avoiding waste of all kinds; and

(7) Urging in your own home or the restaurants you frequent the necessity of economy in food, and requesting the observance of these pledges by other persons.

Our problem is to feed our allies this winter by sending them as much food as we can of the most concentrated nutritive value in the least shipping space. These foods are wheat, beef, pork, dairy products and sugar.

Eat Less; Save More

Our solution of the problem is to eat less of these and more of other foods of which we have an abundance and to waste less of all foods.

Sign the pledge and turn it in to your state Food Administrator; then use your experience as a leader and organizer to have it signed by your employees and associates. There are no fees or dues. You will be put upon your mettle as a man or woman. The people of this country must play a great national game in this food-pledge campaign. Who will get the most signatures? After the signatures there will be a system of weekly reporting by the different groups of the number of wheatless, meatless and wasteless meals eaten by each group during a certain number of weeks. The game will be kept track of by an official weekly score showing how much wheat, meat, sugar and fat we are able to send to our allies.

As the Food Administration says, "United we eat, divided we starve."

The Food Pledge

To the United States Food Administration:

I pledge myself to use the practical means within my power to aid the Food Administration in its efforts to conserve the food supplies of the country, and, as evidence of my support, I wish to be enrolled with yourselves as a volunteer member of the Food Administration.

Name .....

Street .....

City .....

State .....

The Readers' Clearing House

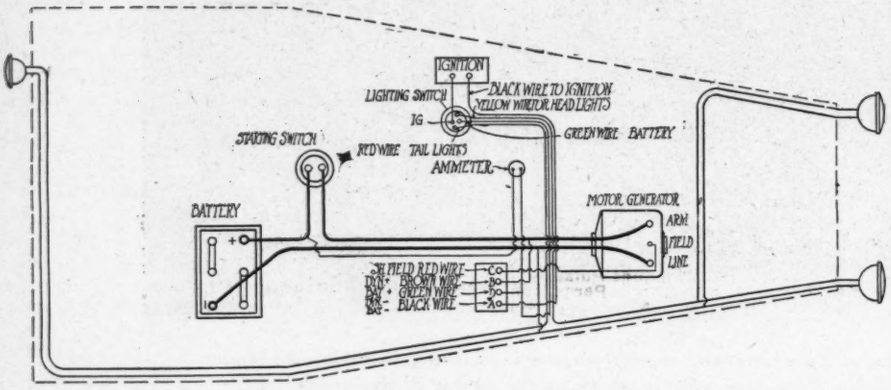


Fig. 1—Wiring diagram of starting and lighting system on 1915 Saxon four

The Electric System

Ammeter on 1913 Locomobile

Q.—Publish instructions how to install an ammeter on a 6-48 Locomobile 1913 equipped with Adlake generator and Gray & Davis starter. —L. S. Stoutt, LaHarpe, Ill.

A wiring diagram of the Adlake electric system as used on the 1913 Locomobile is shown in Fig. 3, together with the manner of connecting an ammeter in the line.

Wiring of 1915 Saxon Four

Q.—Publish a wiring diagram of the starting and lighting system on a 1915 Saxon Four roadster equipped with a Ward Leonard single-unit system.—Thomas Kirkwood, Fort Benton, Mont.

This diagram is shown in Fig. 1, together with the method of connecting an ammeter, should you care to install one.

No Spark on His Car

Q.—On a Chalmers Six having the non-stall starter the light fuse burns out when the clutch is fully disengaged. Why is this?

2—On a Chevrolet Baby Grand we get a fine spark to the distributer, but mighty little out of it. We can find no short in it. Can you suggest something?—G. R. Spencer, Afton, Iowa.

1—Getting mighty little out of it is not very clear. Does the engine miss under certain conditions, or will it not run at all? Examine the distributing brush and terminals on the wires going to the plugs, for if you get a spark to the distributer and not from it to the plugs, the trouble must be between the distributer and plugs.

2—It must be when the clutch is fully withdrawn it or a part of its operating mechanism comes in contact with some of the wiring and causes a short circuit.

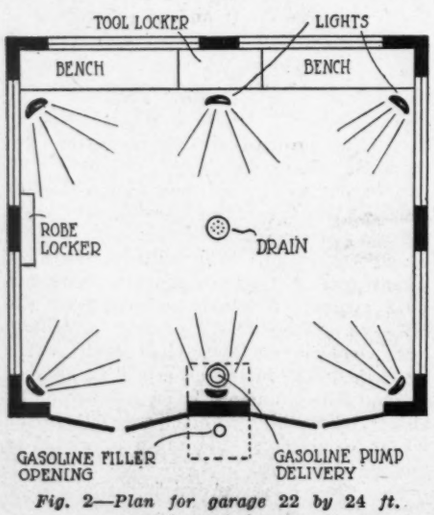


Fig. 2—Plan for garage 22 by 24 ft. with work bench

Wiring Diagram of Chalmers 6-40

Q.—Publish a wiring diagram of a 1915 Chalmers 6-40 five-passenger car, showing ammeter connections if it is possible to install one. This model is equipped with a single-unit system with motor generator under front seat with shaft to flywheel gear. —N. E. Nelson, Marysville, Wash.

The wiring diagram of the motor-generator, battery indicator, etc., is shown in Fig. 5. The indicator shows whether or not the battery is being charged.

Single or Double Unit System

Q.—Which is the most popular, a two-unit starting system or single-unit system?—W. R. McQuigg, Wooster, Ohio.

Both systems are giving satisfaction, although the majority of car manufacturers are using the two-unit outfit. The design of the powerplant sometimes makes it impossible to use one or the other systems and the maker has no recourse but to fit the one serving the purpose best. But so far as efficiency, etc., is concerned, either the two or single-unit system will be found all right.

Wiring for Combination System

Q.—Publish diagram for wiring a Chalmers model M with 6-volt Willard battery. Car is equipped with Remy generator and Ward-Leonard cutout. Generator has rotary head attached for ignition.—P. S. Hawkins, Detroit, Mich.

Your request refers to a combination of three different Chalmers cars, as there was no Chalmers car combining the units which you mention. On all Model M Chalmers cars made during the year 1911 and 1912, Chalmers used the Bosch magneto equipment. On the Chalmers 6-40 the Atwater-Kent system was used for ignition, and for the generating system both Gray & Davis and Ward-Leonard generators are employed. On the 6-30 Model the Westinghouse starting motor and generator is used, and the Remy distributor for ignition purposes. It is impossible to give a diagram of the combination you mention for this reason.

Spark Fails at Times

Q.—I have a Maxwell 1916 model car, which runs good at times and then won't go at all. There seems to be no spark. I disconnected the self-starter and the dry cells and cranked it by hand, and it ran all right on the magneto. I have taken the magneto off the car and it sparks every time when turned over by hand. How could the magneto be grounded when all wiring except from magneto to spark plugs is disconnected?—A Reader—Walker Bros., Ely, Neb.

The fact that the magneto sparks when turned over by hand does not necessarily indicate that the spark takes place in the combustion chambers, where it not only has to jump the gap between the plug points, but it must do this under pressure. Failure to deliver a strong spark may be due to weak magnets or some other internal defect of the magneto. Before suspecting the magneto, however, check up on the electric system for short circuits or broken wires. Sometimes a wire becomes broken on the inside and as the break is hidden by the insulation, it is hard to find. Such a wire may make connection at times and then through vibration, the ends come apart causing the engine to stall or misfire. If you think the trouble is in the magneto, better send it to someone familiar with this class of work and have it tested.

Various Electrical Questions

Q.—Describe the method for determining circuits in different makes of ignition coils taking battery and high tension magneto current.

2—Does this test apply to all makes of this type of coil?

3—Can a coil of this type be used with a magneto of the same type but of a different make?

4—If possible explain the test to determine what makes are adaptable to one another.

5—Do ignition systems of this type carry the condenser in the coil, or in the magneto?

6—Give the test to determine where the condenser is carried.

7—Do all dual type high-tension magnetos have separate breaker points for battery current and magneto current?

8—How can the battery breaker points be distinguished from those for the magneto to primary current?

9—Do any of this type use the same points for both? Give test for same.

10—How can a dual type of high tension magneto be distinguished from a straight

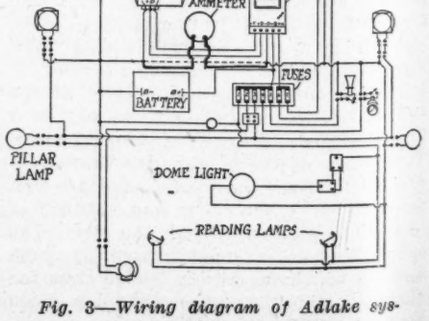


Fig. 3—Wiring diagram of Adlake system on 1913 Locomobile

high tension type; also from a low tension type.

11—How can a dual type coil for battery and high tension magneto be distinguished from a coil for battery and low tension magneto?

12—Would too wide an opening at the breaker points, with retarded spark, cause an engine to back fire when cranked by hand, if the magneto had been timed when the points had normal opening?—F. A. Sevigne, Chicago.

1—There is no general test to determine which binding post on one part of an ignition system has to be connected to a certain binding post on another part of the system. If the wires are disconnected and you do not know how they were connected, it is necessary to get a wiring diagram from the maker.

2—A magneto coil can be used with a magneto of similar type but of different make provided the two magnetos generate about the same voltage at the same engine speed.

3-4—The test to determine whether a certain coil can be used with the magneto of another make would be to try it.

5-6—In ignition systems of this type the condenser is always carried on the magneto. This is due to the fact that the terminals of the condenser have to be connected across the circuit breaker, and as the circuit breaker is always on the magneto, if the condenser is carried on the magneto this can be done without outside wiring.

7—Not all dual type magnetos have separate circuit breakers for battery current and magneto current respectively, but if the same circuit breaker is used for both currents a commutator must be carried on the magneto for transforming the battery current into an alternating current, so that the direction of its travel will be always the same as that of the magneto current.

8-9—We know of no methods of distinguishing between the battery breaker points and the magneto breaker points. As any good circuit breaker will serve for both magneto and battery current there can be no such method.

10—The dual type high tension magneto can be distinguished from the straight high tension type by seeing whether it has either two circuit breakers or one circuit breaker and a commutator. A high tension magneto can be distinguished from a low tension magneto by exposing the armature. The armature of a high tension magneto has a winding of very fine wire over the coarse wire primary winding.

11—A dual type coil for battery and high tension magneto ignition has both a primary and a secondary winding and therefore at least three binding posts, whereas a coil for low tension ignition (make and break) has only a single winding and therefore only two binding posts.

12—If the gap between the breaker points is too wide, the engine will fire slightly earlier than if the gap is normal.

Miscellaneous

Axle, Bearings, Etc.

Q.—Which side of a clutch leather should go next the cone?

2—How can we stop grease from leaking out of Ford axle housings? We have tried new washers, putting waste in the housing, etc.

3—We cannot tighten our Ford motor bearings so that they will stay tight over 3,000 or 4,000 miles. Have tried putting in new crankshaft and bearings but without avail. Shouldn't they last longer than that? Should they be scraped to fit? How would you advise tightening them?—G. R. Spencer, Afton, Iowa.

1—It is customary to place the rough side of the leather out when recovering the cone.

2—Drill a ⅜-in. hole at the bottom of the axle tube near the wheel. This will not prevent the grease leaking out but it will not get onto the brakes and wheels.

3—You fail to state whether the trouble is with the connecting rod or main bearings, but we assume that it is the latter. Three or 4000 miles of travel will loosen up the bearings to quite an extent, especially if the engine has been starved of oil at times.

To adjust the main bearings, remove the three babbitted caps and clean the bearing surfaces with kerosene. Then apply Prussian blue to the bearing surfaces. Put the rear cap in position first and tighten it up as much as possible. When properly fitted you should be able to turn the crankshaft with one hand. If it moves too easily, file off some of the cap to make it fit closer.

After the cap has been removed, note whether there are any high spots. If the spottings do not show a true bearing surface the babbitt should be scraped and the cap refitted until it fits properly. The same operation is carried with the center bearing and then the front one. Be sure to put plenty of oil on the bearing surfaces before tightening the bolts in the caps, otherwise the babbitt is apt to cut out when the engine is first started before the oil in the crankcase can get to the bearing. This is important.

TO assist readers in obtaining as a unit all information contained in this department on a certain subject in which they may be most interested, such as ignition, carburetion, etc., MOTOR AGE has inaugurated the segregation of inquiries into classes of allied nature. Questions pertaining to cooling will be answered under that head and so on.

THE ELECTRIC SYSTEM

L. S. Stoutt.....LaHarpe, Ill.
Thomas Kirkwood .....
.....Fort Benton, Mont.
G. R. Spencer.....Afton, Iowa
N. E. Nelson.....Marysville, Wash.
W. R. McQuigg.....Wooster, Ohio
P. S. Hawkins.....Detroit
Reader .....Ely, Neb.
F. E. Sevigne.....Chicago

MISCELLANEOUS

G. R. Spencer.....Afton, Iowa
F. M. Ramos.....Henrietta, Okla.
C. E. P.....Dallas, Tex.
Bethel P. Brown.....Henderson, Ky.
F. W. Meister.....Mount Pulaski, Ill.
F. W. Aubry.....Perry, Iowa
W. E. Pieper.....Milwaukee, Wis.

LUBRICATION

Robert A. Lancraft .....
.....New Haven, Conn.

VALVE TIMING

S. W. Alter.....Forest, Ohio
Correction .....

ENGINES

M. Salmond.....Grand Rapids, Mich.
G. R. Spencer.....Afton, Iowa
Edward L. Nute.....Melrose, Mass.

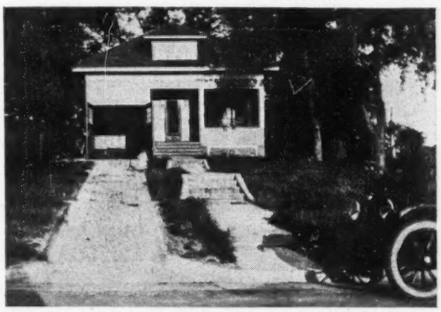


Fig. 4—How a reader built a garage into his house

Why Not?—He Asks

Editor MOTOR AGE: Why not the air-cooled six with balanced crankshaft, overhead camshaft and flywheel type starter or motor generator?

Why not incorporate the four highly developed standards into one highly efficient motor?

Why not the highly efficient flywheel type motor generator as an integral part of front of crankcase, with the armature mounted on the front end of crankshaft?

Why not with the removing of the air-cooled hood, give the engineer the same accessibility to the generator as in the central station generating units?

A standard eventually, why not now?
C. E. P., Dallas, Tex.

Straightening Bent Fender

Q.—Give instructions how to straighten up a fender and the tools required.—F. M. Ramos, Henrietta, Okla.

Turn to the Repair Shop page in this issue. You will find given methods and tools required for this kind of work.

Steadying Lights on Ford

Q.—How can I make a homemade device for a steady light on a Ford?—Bethel P. Brown, Henderson, Ky.

There are on the market several types of instruments designed to steady the lights of a Ford car and as these are not very expensive, we think it would pay you to purchase one of them. It has been our experience that most of the home-made devices are but makeshifts and in the long

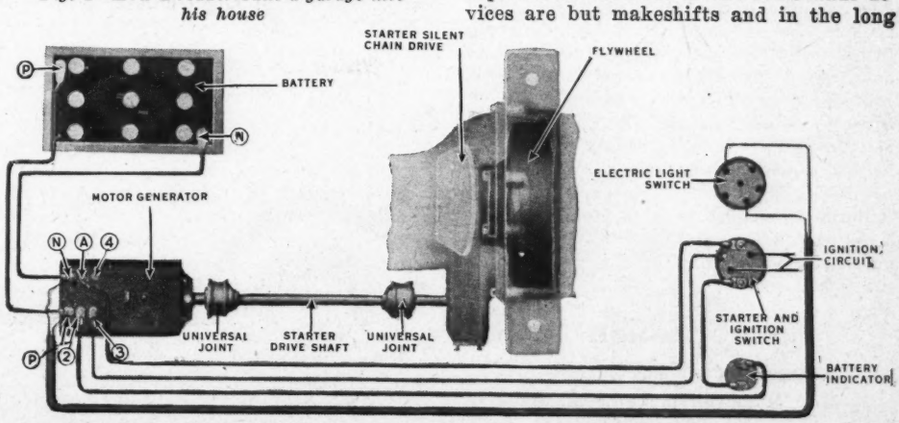


Fig. 5—Wiring diagram of motor-generator, battery, indicator, etc., on Chalmers 6-40

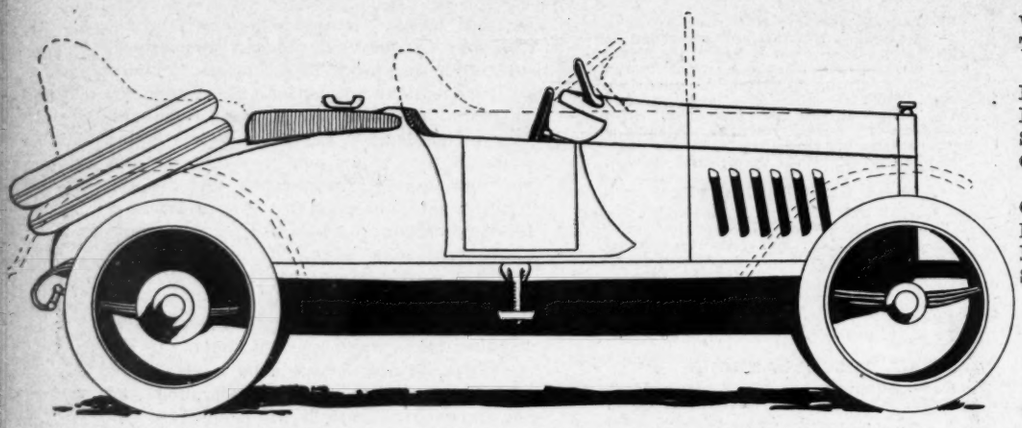


Fig. 6—Suggestion for transforming Oldsmobile car into speedster type

run the owners have given them up for one of the manufactured articles. It is better and cheaper to let the manufacturer do the experimenting.

Wants Garage Plan

Q.—Submit a plan for a brick garage, size 22 by 24 ft. I judge this to be large enough to house two cars and provide room for a work bench.—F. W. Meister, Mount Pulaski, Ill.

In Fig. 2 is shown a plan of a garage 22 by 24 ft. giving the location of the workbench, robe locker, gasoline pump installation, etc.

Garage and Home in One

Editor MOTOR AGE:—The accompanying illustration, Fig. 4, shows a garage which I have built into my residence. What was formerly the den, a room 6 by 12 ft., is the back part of the garage, and the 10-ft. porch with the house roof extending over it made the additional floor space. The hot-air heating of the den was not disturbed. I now am able to drive home, close the big garage doors from the inside, get out of the car, walk about 7 ft. back in the garage on the right side, up four steps and open the door into the parlor.—F. W. Aubry, Perry, Iowa.

Weighing Ford Flywheel

Q.—My Ford sedan is equipped with Rayfield carbureter and Eisemann high-tension magneto. I also carry a storage battery, but no generator or starter; therefore using the regular Ford magneto.

1—Would weighting the flywheel give me a smoother running engine? This could easily be done by casting a ring and fastening it over the magnets.

2—Would Lynite pistons stand up in an engine equipped as mine?—W. E. Pieper, Milwaukee, Wis.

1—We do not believe that the attachment of a ring on the flywheel would be of any assistance in obtaining smooth running. When your car is in high gear the transmission acts as an additional flywheel and this is probably one reason why the engine flywheel is not made heavier. Smooth running of the Ford engine is a matter of correct carburetion, ignition, lubrication and valve action. When these are adjusted to concert pitch, the engine will run as smooth as it is possible to get a four-cylinder affair, providing there is not excessive wear.

2—Yes.

Lubrication

Oiling of Gnome Engine

Q.—How is the oil in the crankcase of a Gnome engine kept from leaking in the bottom cylinder when the engine is at a standstill?

2—Has the engine an oil pump and where is the oil reserve?—Robert A. Lancraft, New Haven, Conn.

1—The Gnome engine has mechanical oil feed and when the engine is shut down the feed stops. There is never any supply in the crankcase.

2—The oil supply is carried in a tank and is fed to the bearings, etc., by a pump.

Valve Timing

Timing 1914 Vulcan Ignition

Q.—The spark on my Vulcan car, 1914, seems to take place too late. Can you tell me how to check up the timing to see if it is correct? It is equipped with Type B, No. 230 Westinghouse ignition and lighting generator.—S. W. Alter, Forest, Ohio.

Remove the spark plugs so the engine can be turned over easily by hand. Bring No. 1 piston to top dead center on the compression stroke with the spark in the extreme retarded position. Now remove the distributer cover and watch the interrupter points as the engine is revolved again slowly. The instant the points begin to separate, stop cranking. Note how far down the cylinder piston No. 1 has traveled. If it has gone more than ¼ in. the spark takes place too late and in this case the distributer must be shifted on the shaft so the engine will fire sooner, that is, the points must be made to open before the piston has traveled too far down the cylinder on the power stroke, provided the spark lever is in the retarded position.

Correction in Ford Timing

On page 24 of the Sept. 27 issue of MOTOR AGE, a mistake was made in setting up the table showing the occurrences in the Ford engine when No. 1 cylinder is firing. No. 4 was shown to be on the exhaust stroke, whereas it will be on the suction stroke. The corrected table is as follows:

Cylinder No. 1.	Cylinder No. 3.
Firing	Exhaust
Exhaust	Suction
Suction	Compression
Compression	Firing
Cylinder No. 2.	**Cylinder No. 4.**
Compression	Suction
Firing	Compression
Exhaust	Firing
Suction	Exhaust

Engines

Horsepower of Hudson

Q.—What is the horsepower of the Hudson speedster?—M. Salmond, Grand Rapids, Mich.

According to the S. A. E. formula the horsepower of the Hudson speedster at 1000 ft. piston travel is 29.4.

Engine Knocks When Raced

Q.—We get a knock out of a Ford engine at high speed which sounds like a loose bearing. We took it down, but found all the bearings tight. It does not knock on a pull, but only when the engine is raced or when the car pulls the engine. Could it be a loose piston? The wrist pins are tight.—G. R. Spencer, Afton, Iowa.

It is possible that the engine has a loose piston, but we have seen instances where such a knock was traced to a loose engine support. Examine the cap on the front engine support and make sure it is not loose. Although the side supports are not so liable to loosen on the frame, it is well to look at them also.

Fuel May Cause Knock

Q.—My three-cylinder 4½ by 4½-in two-cycle engine was built by the Atlas Co. This engine when worked hard tends to knock in each cylinder similar to advanced ignition. The cylinders are offset ¾ to ⅞ in. and have comparatively short connecting rods. Would this not incline toward making an engine knock?

2—This machine fires 1-2-3. Would firing 1-3-2 make any noticeable difference in balance? I see practically no advantage in changing from 1-2-3 to 1-3-2 since it is only necessary to read the cylinders from the opposite end to get the stroke sequence the same, namely, 1-2-3 would be 3-1-2 if read from the rear cylinder, and brings the stroke sequence the same as 1-3-2 when read from the front cylinders. Does the direction of rotation come into effect here?

3—As you know, these engines were built with crank disks and positively operated disk inlet valve. Peculiar to any three-cylinder engine, this machine has a serious fore and aft out-of-balance vibration, synchronous with crankshaft rotation when run about 1200 to 1400 r.p.m. While it is impossible to dynamically balance any three-throw shaft with cranks 120-deg. spacing, is it not a great improvement to place two balance masses very nearly diametrically opposite each other at opposite ends of the shaft, one directly opposite No. 1 throw and the other at the opposite end of the shaft and very approximately opposite the first between two and three throws, a little advanced between 3 deg. to 5 deg. to allow for rotative inertia?

Experiments I have carried on in a small way point very distinctly to this as a superior method over endeavoring to balance with masses

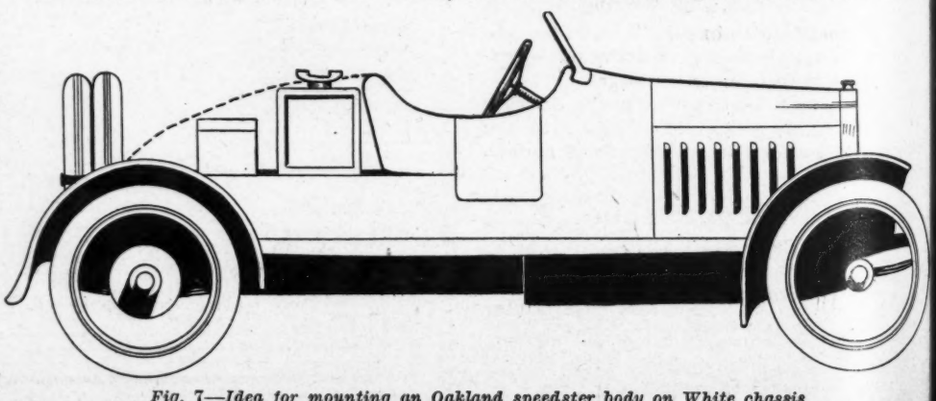


Fig. 7—Idea for mounting an Oakland speedster body on White chassis

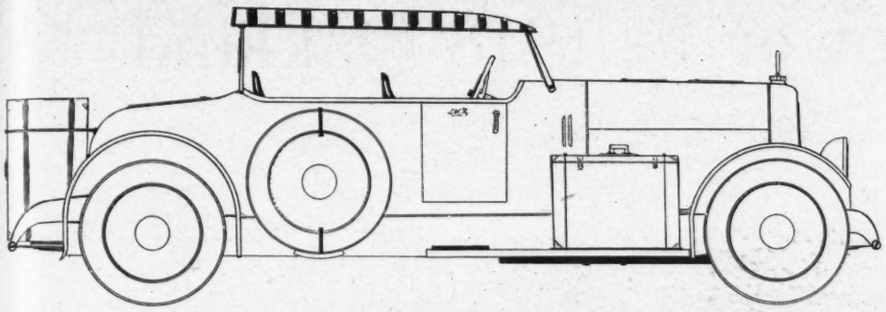


Fig. 8—Reader's idea of a real touring car whose appearance can be changed

diametrically opposite each crank throw as is the case at present.

My engine pistons and cylinders are very nicely fitted, having recently been reground, the pistons having a clearance when cold of .003 to .004. The main crankshaft bearings are in perfect shape and wrist pins an excellent fit. Carbon can hardly be the cause of the knock since two cycle machines never deposit much carbon and this one in particular is very free from it.—Edward L. Nute, Melrose, Mass.

1—The offset would not produce the tendency to knock, rather on the contrary. The knocking may possibly be due to the inability of the engine to handle the much heavier fuel prevailing now as compared with the time when it was built.

2—The order of firing is of no importance.

3—The couple causing the fore and aft rocking tendency can be balanced by introducing an opposing couple in the manner suggested.

Rebuilding

Converting 1912 Oldsmobile

Q.—Illustrate a snappy speedster body with fenders, on a 1912 Oldsmobile Limited touring chassis. The lines of body are to be full streamline, including new hood, if necessary, using the same radiator if possible, with top almost disappearing; tires carried in rear vertically, cowl projecting over the instrument board, similar to the 1915 Oldsmobile 8; sides of body and doors to level with shoulders of the average person; cushions to be almost on floor level, rear deck to be sloping.—J. Lesmeister, Harvey, N. D.

A suggestion for a speedster body on a 1912 Oldsmobile chassis is shown in Fig. 6. The dotted lines show the original body.

Oakland Body on White Chassis

Q.—Show drawing of an Oakland speedster body, model 36, mounted on a White sixteen-valve chassis, with these changes: One-piece fenders, wire wheels, slanting wind shield, square gas tank instead of round, and no top.—A. R. Eades, Beaumont, Tex.

A suggestion for mounting an Oakland speedster body on a White sixteen-valve chassis with the features you ask for is shown in Fig. 7.

Readers' Idea of Touring Car

Editor MOTOR AGE—I inclose drawing of what I consider to be a real touring car and yet one which can be changed in a few minutes to look like an ordinary passenger car. The wheelbase is 144 in. in order to provide plenty of room for the occupants and the luggage in the rear and to facilitate easy riding. The body is of the conventional four-passenger type with the exception that all the seats are of the bucket style, which are comfortable for long tours.

To provide plenty of cool air in summer two vents are placed in each side of the cowl and a small electric fan directly under the instrument board carries the air to the front and rear seats.

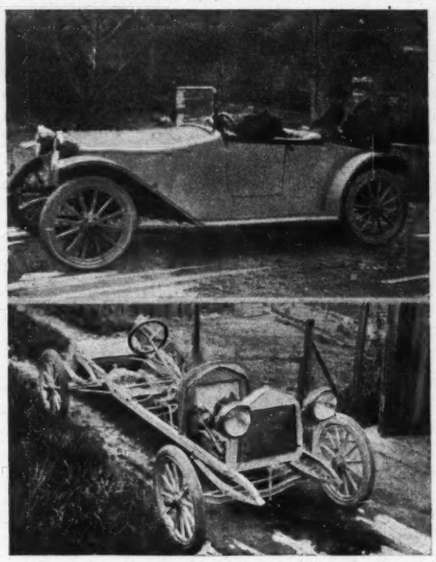


Fig. 9—Remodeled Flanders 20, done by hand and with ordinary tools

The running board is riveted to a deep frame and runs about half the length of the car, providing space on each side of the hood for one or two grips and serving as a step under the door. Opposite the rear seats are carried the spare wheels, all wheels on the car being of the disk type which renders cleaning comparatively easy.

The top is made of a dull material and looks very much like a boat awning, the curtains being carried in the front and rear. This top can be taken off by unfastening the catches and exchanged for a striped awning, as in the illustration, when the owner sees fit to do so.

Back of the body is a deck provided with two doors at the top and back. One-third of this is divided into a miniature ice box, carrying the ice at the top and food at the bottom. The other section of the deck contains the cooking utensils, more food and if desired a small oil stove. This deck is amply large enough to hold all these items and more if necessary. A trunk rack is placed in the rear and a trunk, grips, cots, or a tent can be carried here.

The frame is 10 in. deep; the engine preferably a six. Gas is carried in the cowl. Springs are semi-elliptic front and rear and the hood has ventilators in the top.—J. W. Ratley, Ardmore, Okla.

Remodeled Flanders 20

Editor MOTOR AGE: The illustrations in Fig. 9 show a remodeled Flanders 20. The work was done entirely by hand and with ordinary tools; even the painting is the work of an amateur. The chassis view shows the drop put in the frame and the suspension of the 22-gal. gasoline tank at the rear. The rear deck is so constructed as to form the back of an emergency seat for two passengers. The windshield is an old one, cut down by hand. The car is equipped with demountable wood wheels. Although the remodeling was done over two years ago and is now somewhat out of date, it may convey to some readers what was possible at little expense. N. E. Nelson, Hartford, Wash.

Ford Engine in Boat

Q.—I am going to build a boat and install a Ford engine in it. What size will the Ford engine handle and how large a propeller?—C. E. Pendleton, Enid, Okla.

In Fig. 10 is shown a sectional view of a suggested boat design using a Ford engine in the powerplant. We believe you will get the best results by making the boat from 20 to 22 ft. long, 5 ft. beam and 1 ft. draft, the latter being for the hull only. The over-all draft or water the boat draws is determined by the size of propeller. If there are obstructions in the water where you will use the boat, better fit some form of skeg or protection below the propeller.

In mounting the engine fit strong oak cross-members in the engine compartment and fasten it in place with lag screws using the same brackets fastened to the engine. Leave the transmission attached and mount the powerplant so it will be level when the boat is in the water and under way. Boats rise out of the water when traveling fast, so you must make allowance for this. The engine will oil better when on a level. Proper adjustment can be made with shims under it.

The illustration shows a cranking device so the engine can be started from the dash. You will also have to arrange to drive a centrifugal or gear pump to force the cooling water around the jackets. Be careful not to get this pump too large, or the engine will be overcooled. You can arrange to run some of the overflow water into the exhaust pipe, a foot or more from the engine, which will help to muffle the noise. It is hard to give specific propeller dimensions, but if you build somewhat after the design shown, we should think one having a diameter of 15 in., three blades and a pitch of 22 in. would be about right.

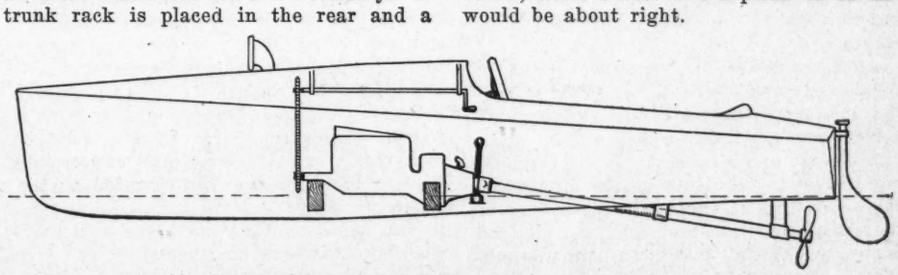
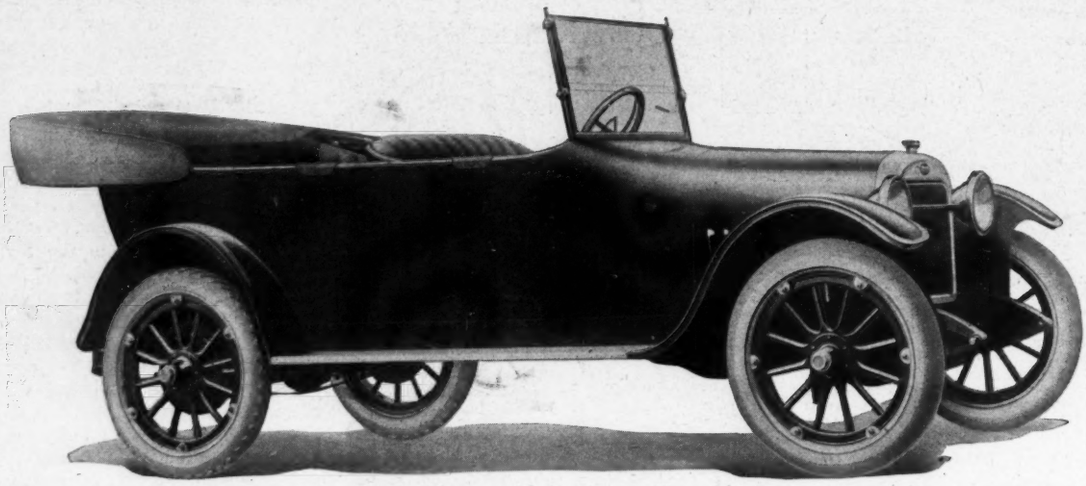


Fig. 10—Suggested boat design using a Ford engine in the powerplant

Greater Power in 1918 Oakland



Oakland touring car which sells for $990, with standard fittings and equipment

BOTH body line and mechanical refinements that marked the Oakland for 1917 are found in greater number in the 1918 series. Development of the car is rounded out through minor changes, with the result, a snappier appearance and greater power. For 1917 the Oakland-Northway unit was increased in horsepower from 35 to 41 at 2500 r.p.m. and for 1918, due to further refinement in the way of lighter reciprocating parts—the pistons are now aluminum and the connecting rods show better machining—the horsepower is 44 at 2600 r.p.m. Last year horsepower was increased through new timing, a different camshaft and a betterment of many factors which had to do with volumetric efficiency. For 1918, with the same piston displacement as a year ago, the result is a more efficienct engine giving both better torque and horsepower characteristics. Moreover, the chassis has been lightened and the whole car correspondingly cut down in weight to the extent of 270 lb.

New Intake Manifold

The question of more efficiently burning the present grade of fuel has also been taken up, and an entirely new intake manifold has been developed. The new manifold has a cast exhaust jacket so arranged that the exhaust passes through a U-connection into the jacket of the carbureter, then down through a tube at the side of the carbureter low speed jet. The greater part of the exhaust heat is given up to the intake at the upper end of the intake manifold, so that a graded heating process is supplied. The upper part of the manifold is kept fairly hot, while the throttle chamber of the carbureter is less and the low speed jet merely warm, the purpose being to allow the mixture to be warmed in stages.

Another factor in the improvement of the horsepower curve at its peak is that the exhaust gases are carried off through a freer passage than formerly.

A change has been made in the lubricating system to take care of the high speed characteristics of the engine. Instead of the circulating splash system, the oil feed is now by pressure through a hollow crankshaft. The oil pump is a gear type driven off the crankshaft, and the oil is forced in the customary manner through drilled leads to the crank pins, from where it is thrown by centrifugal force to the cylinders and other bearing surfaces. A pressure gage is supplied on the dash and the lead from the crankcase oil pump to the pressure gage is the only external part of the oil piping. The internal position of the oil channels keeps the supply of lubricant warm and fluid.

More Accessible Now

From the maintenance standpoint, the new Oakland car has been made more accessible. The removable head is continued, this engine being of the overhead valve type. The removal of the head carries with it the entire valve action as a unit. When the head is taken off the cylinders are accessible for the removal of carbon, and at the same time the valves and other combustion chamber parts can be freely inspected and adjusted. When the bottom pan is removed it is possible to work on the entire engine without further disassembly, as the pistons can be pulled out past the crankshaft and any of the bearings can be inspected and taken up. The timing gears can be reached by removal of the front cover, and for adjustments on the clutch it is only necessary to take up the toe board. The gearbox is fitted with a large cover plate which facilitates inspection of the transmission units.

While the chassis is essentially the same as last year's Oakland, known as the Sensible Six, refinements in detail connections have made it lighter. It is still of the tapered type, and the drive is still Hotchkiss.

Five body lines are furnished on the 34 B model, which represents the Oakland line for 1918. There is a five-passenger touring and a three-passenger roadster selling for $990; a roadster coupe for $1,150; a five-passenger sedan for $1,190; and a four-passenger coupe for $1,490. The sedan and roadster coupe are convertible types. All these cars are mounted on the same chassis of 112 in. wheelbase, which is the same as that employed for 1917, when the car was lengthened ½ ft. over the preceding model.

The colors this year are coach green for the body and wheels, with hair line red striping. The frame, running gear, and fittings are black, with nickel trimmings on the exposed metal parts.

The powerplant is an over-head valve Oakland-Northway design with detachable cylinder head. It has a bore of 2⅛ in. and a stroke of 4¾ in. The six cylinders are cast in a single block, and the entire cylinder head is removable as stated. This removable head carries the valve action, the water jacketing for the combustion chamber, and the necessary manifolding passages.

One of the features of the engine which is unusual is in the front construction which combines the water pump impeller, fan and fan bearing. This makes a unit of the fan and water pump, with the fan belt driving both. The water connection is direct from this point to the radiator with the pump case a part of the cylinder block and also forming the fan support.

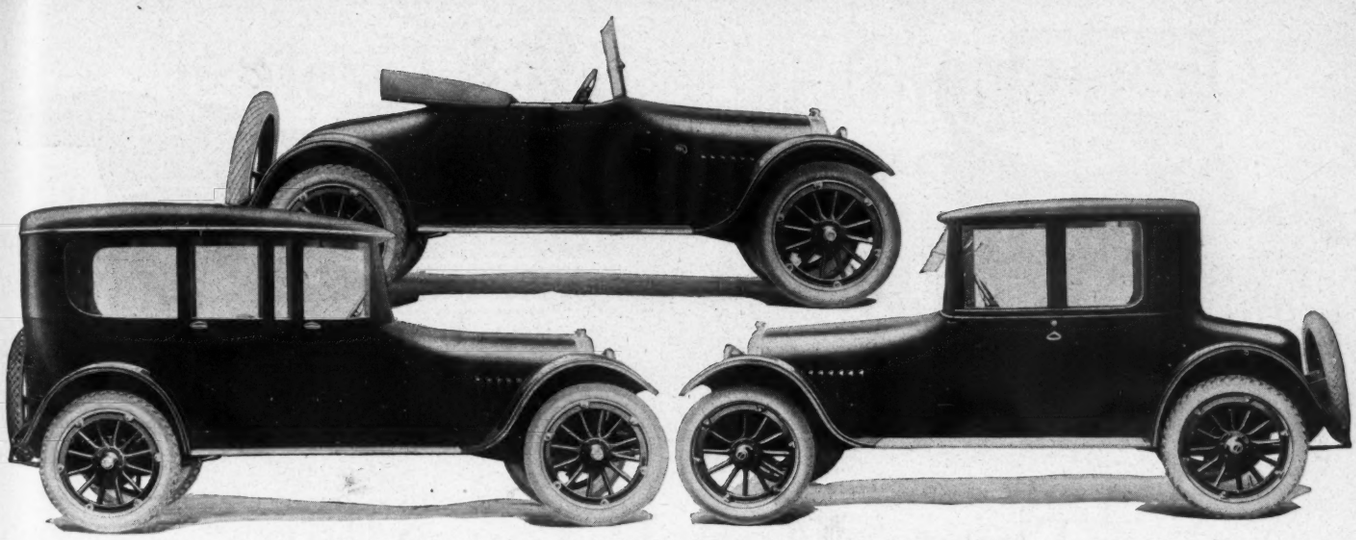
Gasoline feed is by the Stewart vacuum system in conjunction with a Marvel carbureter. The vacuum tank is on the front of the dash, that is, engine side, with the main tank having a capacity of 12½ gal. at the rear. The Marvel carbureter is provided with a heated-air intake and is mounted high on the engine.

Delco equipment is used for ignition, lighting and starting.

Both the clutch and gearset are in unit with the Northway engine. The clutch is a cone type with a ball bearing release and the gearset provides three speeds with reductions in the gearbox of 3.09 to 1 on low, 1.73 to 1 on second, and direct on high. The reverse ratio in the box is 3.98 to 1. These, of course, are multiplied by the 4.5 ratio in the rear axle for final reduction, giving ratios of 13.9, 7.8, and 4.5 on low, second and high speeds, respectively, and 17.9 on reverse gear.

Chassis is Simple

Two universals and a hollow propeller shaft form the drive combination between the unit powerplant and the rear axle. Since the Hotchkiss drive is employed, torque being taken through semi-elliptic



Three of the five body models furnished on the 1918 Oakland chassis. Left to right, the five-passenger sedan, the three-passenger roadster and the four-passenger coupe

springs, these and the other driving units have been made extra heavy in construction.

The rear axle is a Weston-Mott, which is a one-bearing floating type with longitudinally split housing. The brakes are contracting and expanding, operating on a 12-in. drum attached to the rear wheels. The brake layout is such as to give a simple chassis, the main rod in the brake being carried back to the rear cross member, at which point a short connecting link is inserted, transmitting the pull to the brake units. Adjustments on the brakes are made by means of turnbuckles which are just forward of the rear axle.

The steering gear is a Jacox irreversible type having a 17-in. wheel. The control is standard and the fittings are complete at the list price. The tires provided are non-skid in the rear and plain tread in front, and there is a full set of dash instruments, including speedometer, ammeter, gasoline gage, oil pressure gage, switch, etc. The storage battery is an 80 amp. Exide; the speedometer a Stewart, and in addition to these the car is provided with a full set of tools, lamps, etc.

Swedish Crucible Adds Two-Tonner

A TWO-TON truck equipment for converting the Ford, after more than a year of intensive experimentation, has been developed by the Swedish Crucible Steel Co., Detroit. This is added to the line which formerly comprised a 1¼-ton equipment, and the mechanical features incorporated are identical in each.

In this adapter, the driving power is communicated to the rear wheels through the original Ford drive shaft, which is not altered in any way. The Ford universal is left in its original position, and an auxiliary drive shaft connects it to the drive shaft, which has been moved back with the axle to increase length of the wheelbase.

The original rear axle of the Ford is also used, but so changed that it carries nothing but the torque, or driving load. The rear wheels of the truck, together with their bearings, carry large semi-elliptic springs, that in turn support the truck body. By this arrangement, the truck load is transferred directly to the wheels themselves.

The drive is of the internal gear type, with a small pinion mounted on the end of the Ford axle, meshing directly with a large internal gear bolted to the wheel. Ball bearings are used throughout the rear construction, and all gears are cut from steel blanks, hardened, and the races ground to a finish. As the larger bearing, carrying the load, is of the slip type, it may be adjusted to compensate for any wear.

Through the gear reduction of the internal gear drive, the final gear ratio is 7 to 1, which is considered the best ratio for this type of equipment.

Both the service and emergency brakes are mounted on the rear wheels. The original Ford service brake is removed, and replaced by a new service brake shaft and pedal, connected to a 16-in. by 2-in. internal brake; the emergency brake operating through the lever as formerly. However, both the service and emergency brakes are connected, and both are applied through the lever.

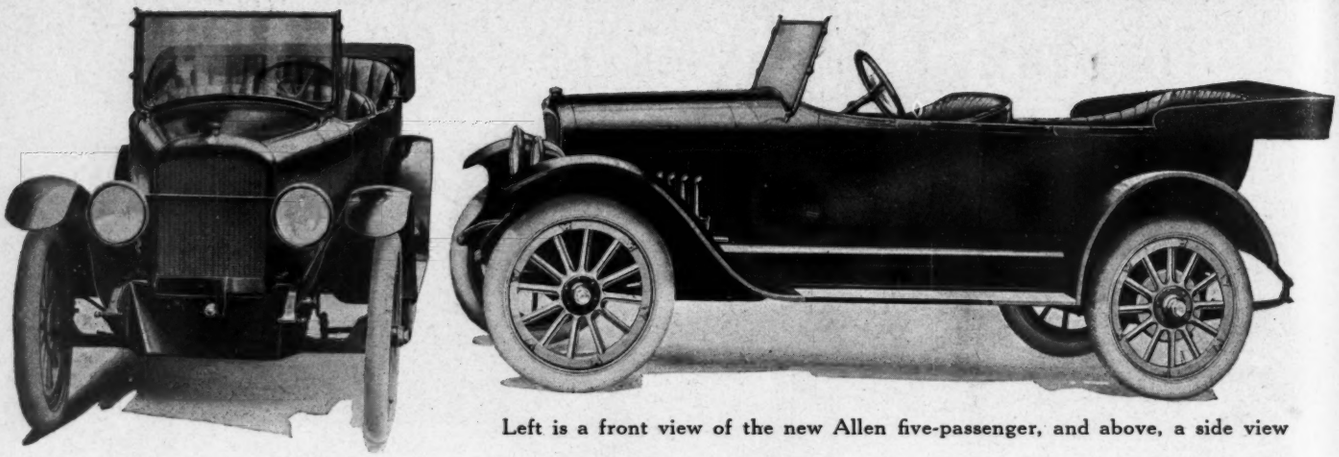
The price of the 2-ton chassis is $875; of the body, $150, and the complete truck, including special demountable rim front wheels, with straight side 23 by 4-in. non-skid tires, is $1,025.

New 2-ton Olsen truck equipment, which sells at $1,025 complete

The Kind of Men Who Drive Military Trucks

INDICATIVE of the efficiency which men enlisted by the Quartermaster's Department show in the motor truck service is a letter from a truckmaster at Fort Benjamin Harrison. He says:

"Just a word relating to the personnel of the motor truck companies of the Quartermaster's Department. Taking this company as a basis I find among the men any number who can tear down a car or truck from end to end, throw the pieces in a pile and then reassemble them. These men are enlisted as sergeant chauffeurs and there is plenty of material here to make up organizations that will handle enough ammunition, food and supplies to make the kaiser look sick. They are also physically fit, able to withstand hardships, and Uncle Sam has nothing to fear as to the ability of this branch of the service to make good."—Jerry W. Hayden, truckmaster, M. T. Co. 318, Fort Benjamin Harrison.



Left is a front view of the new Allen five-passenger, and above, a side view

Three Models for Allen

Two Are Open Types; One Closed

FLEXIBILITY and economy are two features that mark the engine in the Allen line for 1918 which will consist of three models—a four and five-passenger touring at $1,095 and a five-passenger sedan at $1,395. Brief mention was made of this line in the last isue of MOTOR AGE. This engine, which is Allen's own make, has a bore of 3¾ in. and a stroke of 5 in.

Cylinders are L-head and lubrication is splash circulation. The carbureter is a Stromberg taking fuel from a vacuum tank and the electrical system is a two-unit Westinghouse. A Borg & Beck single plate dry disk clutch together with the gearbox is in a unit with the engine. Drive is Hotchkiss, there being a hollow propellor shaft with two universals that transmits power through spiral bevel gears to the floating rear axle.

One side of the engine carries practically all of the accessories. For example, the plugs, valve adjustment, oil pump, oil filler, priming cups, etc., are all on the carbureter side of the engine. The vacuum feed is Stewart which takes fuel from a 13-gal. tank in the rear.

The new Allen bodies are roomy, low hung and finely finished. The upholstery covers double deck springs which make for easy riding. The rear seat is 49 in. wide which gives room for three large passengers in the rear.

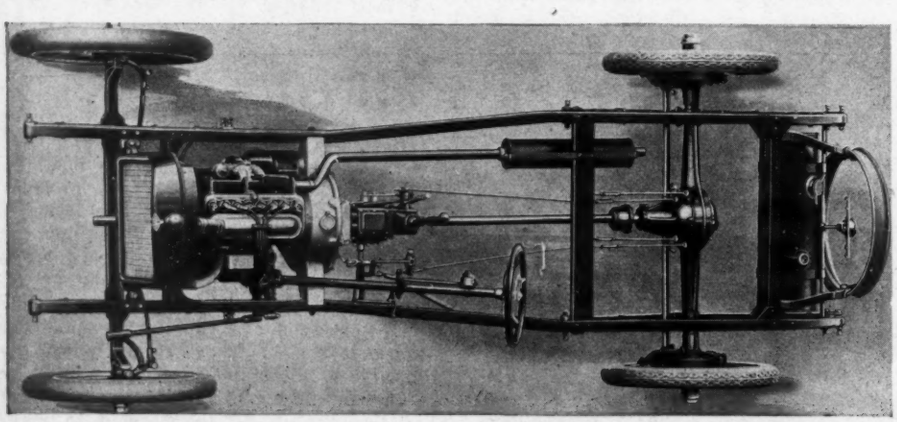
Neatly arranged on the dash is the carbureter choke, speedometer, ammeter, Connecticut automatic ignition circuit breaker and dash light. All electric controls for starting, lighting and ignition and the Garford motor-driven horn are in unit in the Connecticut rotary master switch mounted just below the wheel on the steering column and locked at the same time by a Yale key.

LAUREL AT ANDERSON, IND.

Anderson, Ind., Oct. 19—The Laurel Motors Corp., which has taken over the Laurel Motor Car Co., has purchased a factory site here and will build a plant for the manufacture of Laurel cars and trucks. Operation in the new plant is expected to start about Jan. 1.

The Laurel company has been making cars at Richmond, Ind., for two years. The new plant will enlarge production and care for agents and territory with whom contracts previously could not be made on account of insufficient facilities to turn out cars. The Laurel will use a new sixteen-valve engine designed by Robert M. Roof of Anderson, who built a sixteen-valve head for Ford cars. The 1918 model will have a 116-in. wheelbase with all the popular types of bodies.

Pending the completion of the new plant the Laurel will be produced in temporary quarters at Anderson. The production for 1918 is estimated at from 3000 to 5000 cars. The price has not been announced but is expected to be in the $1,000 class.



Chassis view of the Allen. Note how right side of engine carries practically all the fitments

MASTER SELLS RIGHTS

Detroit, Oct. 19—The Master Carbureter Corp. has sold the manufacturing rights of its carbureter to a new company, the Master Carbureter Co. of Los Angeles, Cal. A new company is being formed to sell primers, which will be called the Master Primer Co. of Detroit. E. T. Daniels, secretary and treasurer, is the only one of the old Master organization that will continue in the latter company.

SUPREME AT FORT WAYNE

Fort Wayne, Ind., Oct. 20—The Supreme Motor Corp. will locate its plant in Fort Wayne, according to plans now under way. Work will be started on new factory buildings within a year. The Supreme company has taken over all experimental work that has been in the hands of the Davies-Mitchell company of Cleveland, this part of the work now being complete.

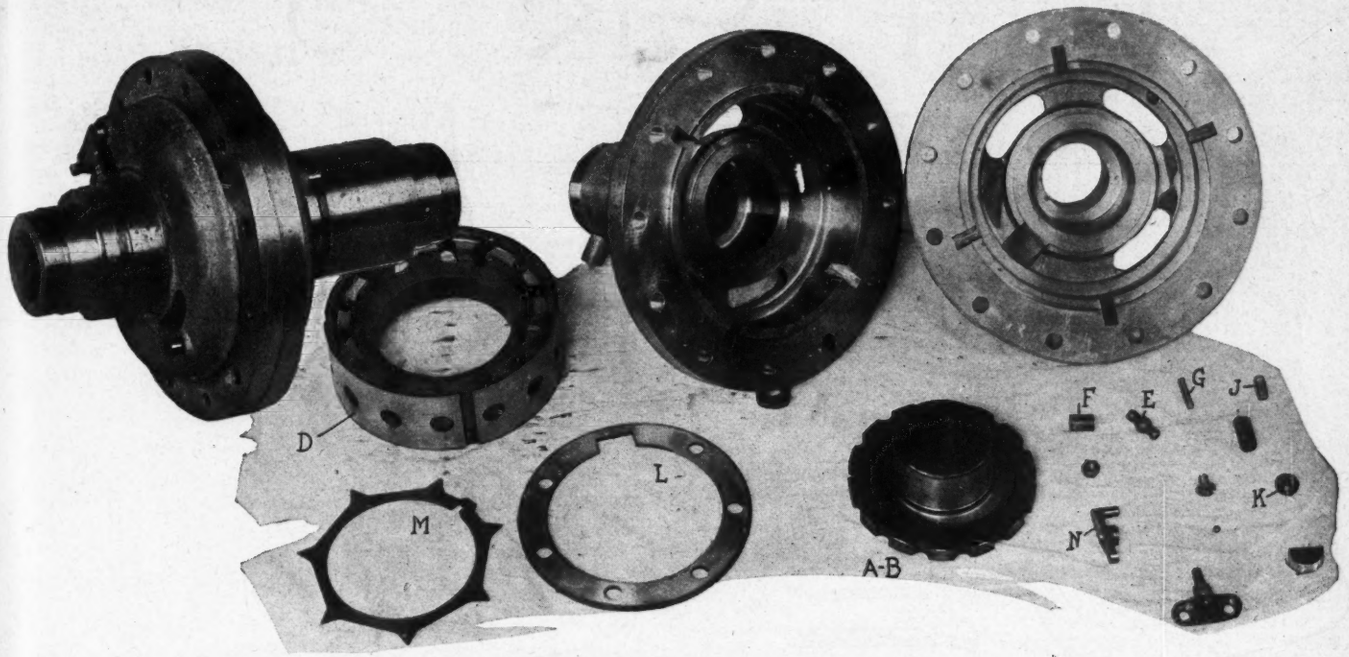
A twin-six engine has been developed. For the present it will not be manufactured, but it will be shown here soon. Supreme also will manufacture a four and a six. All its engines are of L-head type, the head being detachable. Special features are the counter-balanced crankshaft and force feed lubrication.

The company plans to bring out within a short time a four-cylinder car, manufactured and assembled here.

QUALITY STARTS PRODUCTION

Chicago, Oct. 22—The Quality Tire & Rubber Co. has begun production of Quality tubes and tubes in non-skid and Supercord types. Gordon Ingalls is president of the new concern.

Bailey Differential for Trucks



Reference to this illustration explains the construction and operation of the Bailey differential for motor trucks

WHAT might be classed as an engineering feat was recently accomplished by the Bailey Non-Stall Differential Co., Chicago. This concern, which heretofore has confined its product to the passenger car field chiefly, was called upon to construct a differential for heavy truck purposes, with the limitation that the carrier be not over 13½ in. in diameter. This differential is capable of handling the maximum torque of a six-cylinder engine having a bore and stroke of 5¾ by 7 in., respectively, and developing 130 hp. at 1000 r.p.m. Incidently this marks the entrance of the company into the manufacture of differentials for commercial vehicles and arrangements have been made to build these in sizes to meet practically all needs. The differential herewith illustrated was designed by John Whyte, chief engineer of the company.

A Few Minor Changes

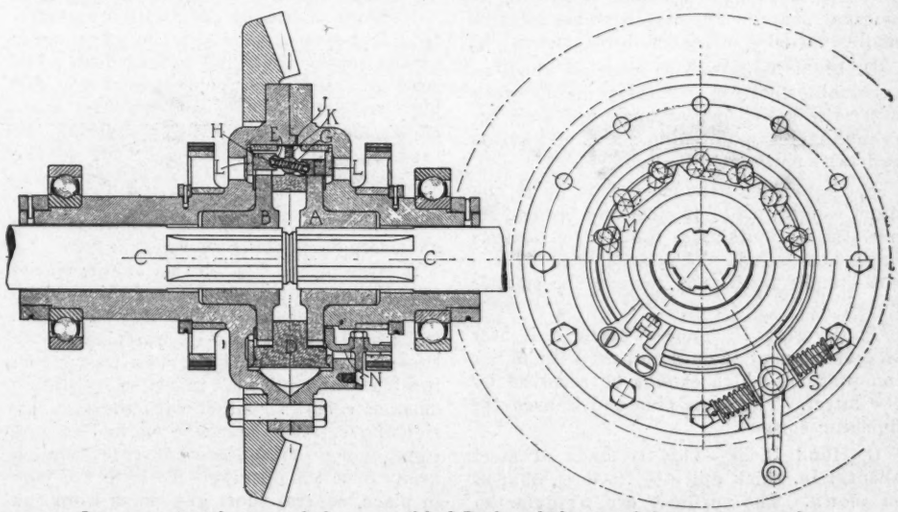
The principle of operation is the same in this large truck differential as on other models of the Bailey, excepting for a few minor changes in the pawls or tilting members to meet new conditions. Some idea as to the size of it can be gained from the fact that the outer race of the supporting bearings has an over all diameter of ⅞ in., while the balls are 1 in. in diameter. The axle shafts are 2½ in. in diameter and the total width of the carrier is 18 in.

A new feature consists of placing band brakes on each side of the carrier whose function it is to release at the will of the driver either side of the differential when a sharp turn is made, as for example when a creeping-drive truck is run around a corner. The action is to hold the inner wheel out of engagement and simply drive the outer in the same manner that the helmsman of a side-wheel steamer turns his boat. In doing this the Bailey company points out that there is no reduction in power inasmuch as there are no gears in the differential.

Essentially the differential consists of the right and left-hand ratchets, A and B, attached to the ends of the splined shafts C-C. The ratchets are made of chrome-nickel steel and mounted face to face in the center driving unit D. The driving members consist of fourteen tilting members, or pawls, E, working in conjunction with hardened pawl pressure rollers, F. Each tilting member is drilled longitudinally for a coil spring, G, bearing at each end on steel pressure balls, H, which operate in spherical seats cut in the ends of the rollers, F. The pawls are held in position by the spring, J, bearing against a spring cap, K. Retaining plates, L, are fitted on each side of the center unit and serve to keep the rollers in place.

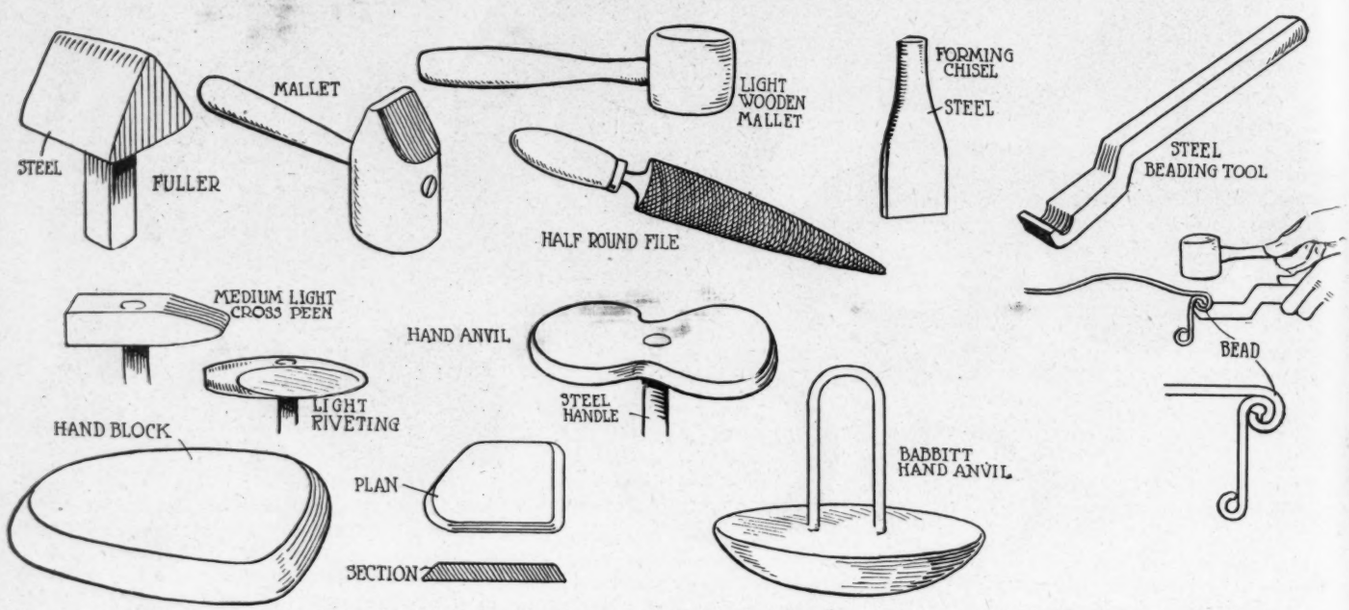
Between the ratchets and retaining-plates are the release plates, M, the latter being cut with seven rising cam surfaces which, when the movement of one of the plates is slightly retarded, causes the seven rollers on that side to be pushed up in the oval slots and out of the circular notches of the ratchets. The same action of the rollers takes place in ordinary use of the differential, the release plates being merely acted upon when the band brakes are operated at the discretion of the driver. Application of the brake causes the release-operating lever, N, to rotate slightly, which in turn moves the release plate sufficiently to throw out the rollers. Contraction of the brake band is secured by compression springs, R and S, the lever, T, serving to hold it normally out of action.

The center driving unit is secured to the two halves of the carrier by four Woodruff keys and the ring gear bolted in place with twelve ⅝-in. machine bolts. The latter, incidently, serve to hold the two parts of the carrier together also, reducing the cost of production.



Cross-sectional view of the assembled Bailey differential for motor trucks

The Motor Car Repair Shop



How to Straighten Metal Parts

THE thing to remember in straightening out bent metal parts is that all parts except that which is to be straightened, must be supported. To insure a good job the work must be done slowly, striking only light blows and gradually the metal will be worked back to its original form. This kind of work requires special tools in many instances, but some of the more common are as follows:

A. Fuller—This fits in the square hole of the anvil or can be clamped in a vise. It is also used as a hand anvil in connection with a light hammer for removing small dents. The rounded and flat surfaces on it adapt it for a variety of uses.

B. Files—Files, particularly the half-round kind are used to remove small pits or hammer marks after the mallets have been used.

C. Heavy Mallet—This is made of wood and used to roughly form the work into its original shape. The flat surfaces of this mallet do not dent nor mar the metal.

D. Light Mallet—Also made of wood, an invaluable tool for smoothing up the work after the heavy mallet has been used for preliminary straightening. A hand anvil is generally used with the light mallet.

E. Cross Pien Hammer—This is of medium weight, made of steel and used to remove small dents after the wooden mallets have been used. The large face of the wood mallets will not remove the smaller dents.

F. Riveting Hammer—This is a lighter weight hammer than E and used for minor indentations which cannot be removed by the latter. The cross pien end is used for finishing corners.

G. Hand Block—This is made of steel about 1 in. thick and 4½ in. long, shaped as shown. The surfaces are irregular so that any one of them might be adapted to any particular surface. The light wood mallet is used with the hand block.

H. Forming Chisel—Made in many different sizes and shapes to form sharp corners, grooves, etc. By regrinding the edge to the desired form the metal may be readily driven to that form.

I. Beading Tool—Used principally on fenders, where the side strips are held in place by rolled edges. When bent these open. The bead may be closed with this tool and a mallet or hammer.

J. Hand Anvil—Similar to hand block, made of steel and mounted on a steel handle. The edges are beveled and will fit various curved surfaces.

K. Babbitt Hand Anvil—This is made in a variety of shapes and sizes by pouring melted babbitt into an unbent portion of the part to be straightened. A handle is fastened to it as shown.

The first step consists of shaping the metal back roughly to its original form with the heavy wood mallet. The metal must not be struck so hard that it will be broken or drawn too far. The hand anvil should be used in connection with the mallet, so that the surrounding metal will be supported. It is better to strike many light blows than a few heavy ones, and the blows should be drawn, rather than applied dead on. The prime requisite is to proceed slowly, feeling out the dents with the hand anvil and directing the blow to the point of bend. When the metal has been worked back roughly with the mallet, the smaller dents are taken out with the small mallet and the job finished with metal hammers.

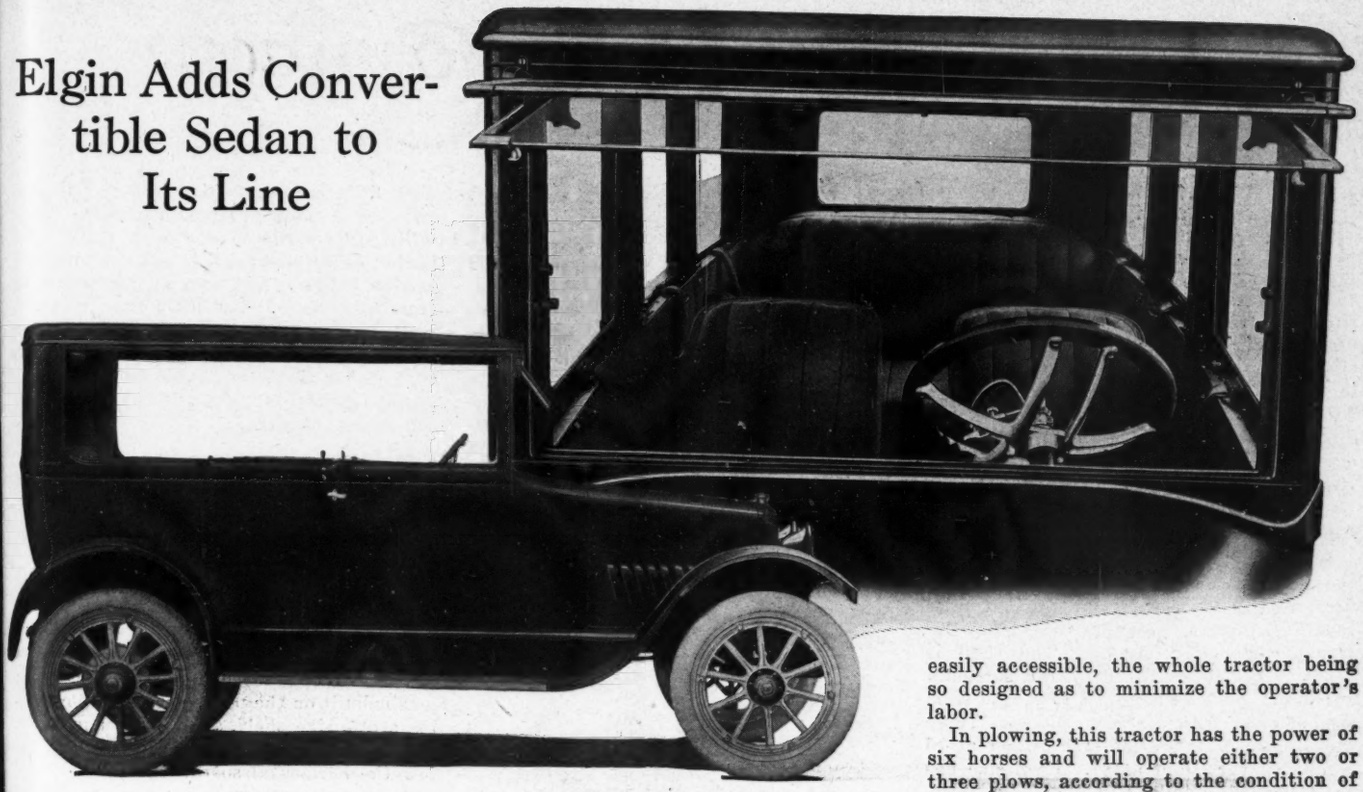
When the work is in this shape there will still be many small raised portions which cannot be taken out by the hammers. For these a file is used and the latter will remove the high spots and pass over the low spots. Then the low spots are pounded up to shape. Gradually it will be found that the file touches all of the surface and the whole can then be dressed down with emery paper to a polished surface.

Roadside Repairs

Here was a car equipped with a pressure-feed fuel system on which the screw cover of the supply tank had become lost. The road was searched for traces of the cap but without success, consequently some means must be provided for covering the tank opening to an air-tight fit, so the system would again work. The tank was placed low on the back of the car and the driver took advantage of this by making an emergency repair as follows:

A large piece of patch rubber was placed over the opening and on top of this a blow-out patch. Then a piece of wood ½-in. thick and about 4 by 6 in. was placed over these. The bottom of the jack was put on the block and the jack raised so its sliding member came in contact with the tire carrier above. The jack was worked in just tight enough to squeeze the rubber patch firmly over the opening. To keep the jack in place, several short guy wires were run from it to different points on the car.

Elgin Adds Convertible Sedan to Its Line



THE Elgin Motor Car Corp. has added a convertible sedan at $1,645 to its line so that it now comprises three models, the others being the roadster and touring types. The sedan is fitted to the standard Elgin chassis which has a 117-in. wheelbase. This body is the Springfield type, having two doors, one on each side, and constructed so that it may be entirely closed for winter driving or entirely open for summer touring. Ample room is given for five persons. Front seats are of the bucket type with passageway between. Gray whipcord upholstery without buttons is used. The backs of the front seats as well as the instrument board are covered with this material. The ceiling is covered with the same material as the seats and door interiors. Among the other features is a heater. Finish is black with silver stripe.

Pick-Ups from the Tractor Field

Allis-Chalmers Power of Six Horses

THE Allis-Chalmers Mfg. Co., Milwaukee, Wis., claims for its tractor that it can work in any ground that can be cultivated by horses. This is because of its comparatively light weight and broad drive wheels coupled with a two-cylinder opposed engine with cylinders having a bore 5¼ in. and a stroke of 7 in. Weighing but 4800 lb., this 10-18 hp. tractor, as it is styled, is of sturdy construction and yet is one of the lightest farm tractors made. Construction is simple and all parts are easily accessible, the whole tractor being so designed as to minimize the operator's labor.

10-18 hp. gasoline tractor which will handle two or three plows

In plowing, this tractor has the power of six horses and will operate either two or three plows, according to the condition of the soil being plowed. The frame is a one-piece steel casting so there are no joints or rivets. The greatest length of the tractor, over-all, is 11 ft. 8 in., height, 6 ft. 3 in. Power is transmitted to the drive wheels through inclosed gears running in oil. High-tension magneto ignition is used and cooling is by centrifugal pump. The clutch is a two-shoe expanding type.

HOLLEY OPERATING IN ENGLAND

Detroit, Oct. 19—The Holley Bros. British factory now is operating though not yet under full force. The plant, which is at Coventry, has a capacity of 500 carbureters a week and employs 120 men. Labor is very scarce, and there have been long delays in obtaining the necessary machinery, the majority of which was imported from this country.

Just now the British government requires the entire output for tractors, and nothing is being made except kerosene vaporizers, of which two models will be produced. The most important is that for the Ford tractor. The other will be called the universal pattern and is adaptable to many kinds of engines.

The British plant operates under the management of the British representative, T. C. Copson. Mr. Copson arrived in Detroit, Oct. 2. In his opinion the use of kerosene in England is so firmly established its continuance on a large scale after the war is assured.

TO DISCUSS TRACTOR SHOWS

Minneapolis, Minn., Oct. 20—The first winter meeting of the Minneapolis section of the Society of Automotive Engineers will be held Nov. 7, at which time a paper on "Future Tractor Demonstrations" will be read. A large attendance is expected on account of past discussions of the subject. The tractor standards committee of the S. A. E. will meet here Nov. 6.

The Accessory Corner

H-M Metal Radiator Cover

THE H-M metal radiator cover is made of sheet metal divided into eight adjustable shutters operated as one. As its chief feature this cover can be operated from the dash and may be entirely closed, half or three-quarters closed or entirely opened as weather conditions make necessary. The cover is attached to the radiator with springs, securing a tight fit and doing away with rattling. It is rigidly constructed and is made for Ford cars only, by the H-M Mfg. Co., Indianapolis, Ind.

Blitzen Spark Plugs

Blitzen spark plugs are guaranteed by the maker, the Ideal Mfg. Co., Kansas City, Mo., to withstand 600 more heat units than it is possible to generate in any internal combustion engine. The shell is heavy gage cold-rolled steel, the porcelain is Koalin and the electrodes are made from special steel with platinum points. These plugs come in two sizes—the Junior at 75 cents and the Giant at $1. Each size has an extension, standard and S. A. E. measurement and the Giant a metric in addition.

Friction Stabilizer for Fords

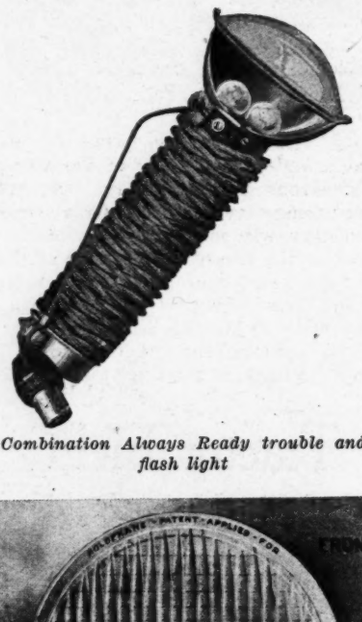
A stabilizer that has no springs but which depends entirely upon friction between steel and fiber plates, the tension of which can be regulated so that the appliance will stabilize the steering of old as well as new Fords, is made by the Ideal Mfg. Co., Kansas City, Mo. An arm, one end of which is fitted between the friction plates that are clamped to the front axle, extends back to tne tie rod and is fastened there by means of a clamp. The only function of this device is to hold the wheels in whatever position the driver puts them. It has no tendency to straighten up the wheels. The stabilizer sells for $3.50.

Tozalone One-Man Tow Bar

By means of this device, a Ford car may be attached to another car, and towed without the necessity of a steersman to steer the towed car. It consists of a bar, attached to the tow car and pivoted to the axle of the car to be towed, and steering it through a pivot attachment on the steering link. When attached, the rear car follows the towing car; may be stopped, or backed through it, and its use eliminates a helper. Not only may one car be towed thus, but two, or even three cars may be successfully handled by one man. It is said that the device may be attached in a minute. Though the principal use of this device will be to tow cars in to the shop for repairs, it will also be found effective in driveaways from distributing centers, and in delivering cars. The price is $8.65. Consolidated Motors Co., Detroit, Mich.

Trouble and Flash Lamp

This combination light takes its current from two sources. The trouble lamp is supplied by the storage battery and the flash light from a special battery. It consists of a nickel-plated, two-globe lamp with cord wound neatly on a spool. All parts can be duplicated, and the battery can be bought from any regular dealer or from the maker. The lamp is 3 by 8 in.; cord, 10 ft. long; trouble lamp, 6-8 volts; flash lamp, 2-9 volts. Lamps are furnished with either single or double contact plugs. Always Ready Mfg. Co., 159 North Jefferson street, Chicago.



Combination Always Ready trouble and flash light

Tire Irons

These tire irons are designed to make it possible to remove the tire rim more easily. They clamp on the rim by tightening two bolts and can be attached in a minute after which they are pried apart with a lever. Price, $1.60 a set of two. E. W. Abbe, New Britain, Conn.

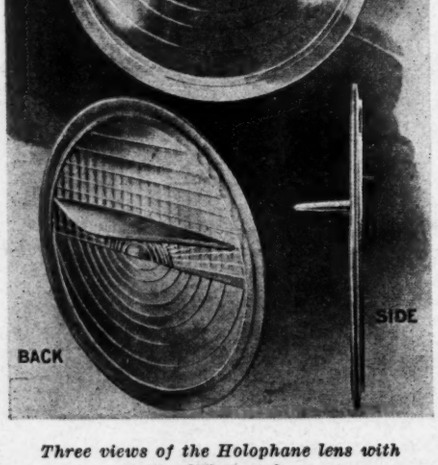
Holophane Lens

The Holophane non-glaring headlight lens is built on the prismatic principle, adding a diffusing shelf, or fin. The horizontal prisms at the top bend the light down below the horizontal so the rays are thrown down on the road, and the prisms radiating from the center bend a portion of the beam down for lighting a wide road area at a distance. The diffusing fin projects back over the bulb and so diffuses the direct light that the glare is said to be completely eliminated. The fin does not interfere with the rays of light coming from the reflector, however, it is claimed, and by keeping the beam of light low, below the 42-in. line, there is no back reflection from the rain or dust so the road can be seen under all conditions. Several states have approved the lens as complying with headlight regulations. Holophane Glass Co., 340 Madison avenue, New York.

Professional Emblems

Emblems in variation of cross designs are furnished by the Art Metal Works, Newark, N. J., for veterinaries, physicians and surgeons. Those for the veterinary are in blue, while those for physicians and surgeons are in green. The emblems come

Radiator emblem for veterinary, left, and Runyan grease cabinet



Three views of the Holophane lens with its diffusing fin

How the tire irons made by E. W. Abbe are operated

Rose tire pump and grease gun, products of J. H. Haney & Co.

complete for attachment to the radiator, or, in one model, for the front of the radiator in case the cap already carries an emblem. The crosses are enameled, while the frame is of gold or nickel-plated. The size varies according to model. Price, $2 each.

Runyan Grease Cabinet

The Runyan self-measuring grease cabinet is a combination container and pump for greases and oil. At each stroke it delivers ¼ lb. into the differential, transmission, universal or timing gear. It will handle transmission grease and heavy oils also, and a job of greasing that would take half an hour ordinarily can be done in about 5 min. with it, it is said. Model No. 20 has a capacity of 20 lb. Price, $7. Runyan Mfg. Co., 405 Market avenue, Grand Rapids, Mich.

Rose Grease Gun

Constructed of heavy material, Rose grease guns are guaranteed not to dent or become useless from hard usage. These guns fill by suction and will suck up through the nozzle all grades of light oils and some kinds of hard grease and fill with hard grease easily when the nozzle is removed. The Rose grease gun is made in sizes both for the car owner and for the shop, the only difference being in the size. The size for the car owner measures 1¼ by 12½ in. This size lists for $1.80. The gun for shop use measures 1½ by 24½ in. and lists for $4. These guns are made by J. H. Haney & Co., Hastings, Neb.

Crowe Fan Belt

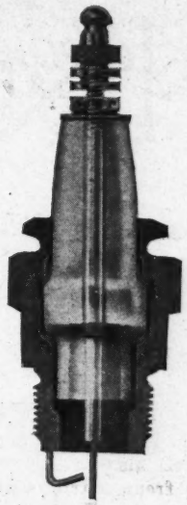
In describing the Crowe fan belt in MOTOR AGE for Oct. 18, the address of the maker, the Mechanical Belt Co., was given as Chicago instead of St. Joseph, Mo.

Ampeco Axle Stand

The product described under this head on the accessory pages in the issue of Oct. 11 was credited incorrectly to the American Machine Products Co., Marshalltown, Iowa. The American Machine Products Co. does not make this accessory.

Pedal Fitment for Fords

A pedal extension to give the feet wider and firmer holding surface on Ford brake and clutch pedals has been invented by Fred C. Grant, Denver, Colo., who has formed a company to manufacture and market the device. It clamps over the regular



Blitzen spark plug, guaranteed to stand excessive heat

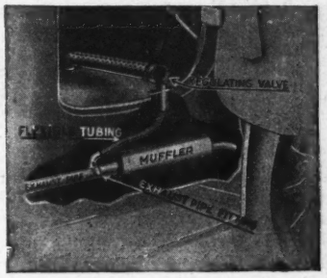
pedal and fastens with a bolt and lock nut. It can be attached in a few minutes, and fits rigidly, prevents side slipping, gives the feet a natural position and makes the use of the brake and clutch easier. Made of aluminum, with roughened gripping surface or rubber top. Price per pair, $1, metal, and $1.25, rubber top. Grant Auto Appliance Co., 819 Fourteenth street, Denver, Colo.

Rose Tire Pump

Fitted with a patented valve that eliminates friction and sucks a full supply of air below the plunger, automatically opening and closing the air supply with every stroke, the hose tire pump made by J. H. Haney & Co., Hastings, Neb., delivers air to the tube without wasted effort on the part of the operator. The pump is made of heavy steel tubing and is subject to hard use without damage. It is said a small child can inflate a tire to its capacity with this pump because of the valve construction. Price, 1¼ in., $3; 1½ in., $3.50.

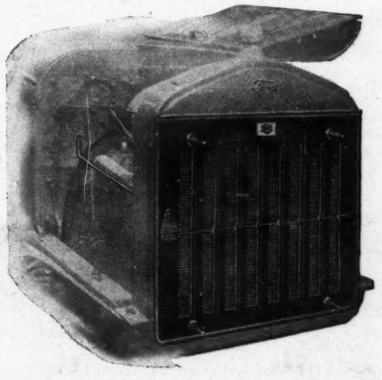
Utility Footrail Heater

Utility protected footrail heaters, made by the Hill Pump Valve Co., Chicago, come in three sizes this year, the smallest of which is known as the Junior, and is exclusively for Fords. Last year there were but two sizes—the standard and the Ford type. Now there is an intermediate size for heating the front compartment of all cars, which is the same as the Ford size except that the latter has the

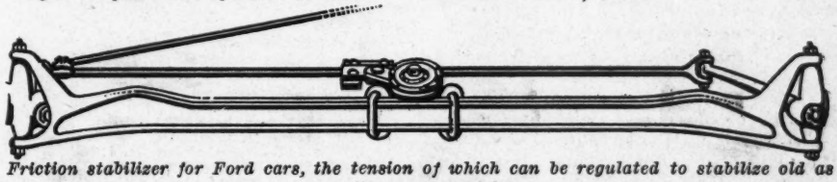


How Utility protected heater is attached to the exhaust

protector finished in rust-proof black, while the intermediate and standard size have a nickel-plated protector. All models are exact counterparts as far as construction is concerned and are applicable both to open and closed cars. The heater consists of a 2½-in. tube carried in brackets with hollow stems that go through the floor. The exhaust pipe is tapped and the exhaust gases carried through a flexible tube to one end of the heater. At this point there is a regulating valve that permits the volume of gas passing through the heater to be optional with the driver. The heater will give off its maximum heat in 3 min., but the regulating feature makes it possible to get a varying temperature to suit the passengers, whether under robes or not. Installation requires only the boring of two holes in the floor board and drilling one hole in the exhaust pipe. The standard size sells for $15, the intermediate, $10, and the Junior, $7.50.



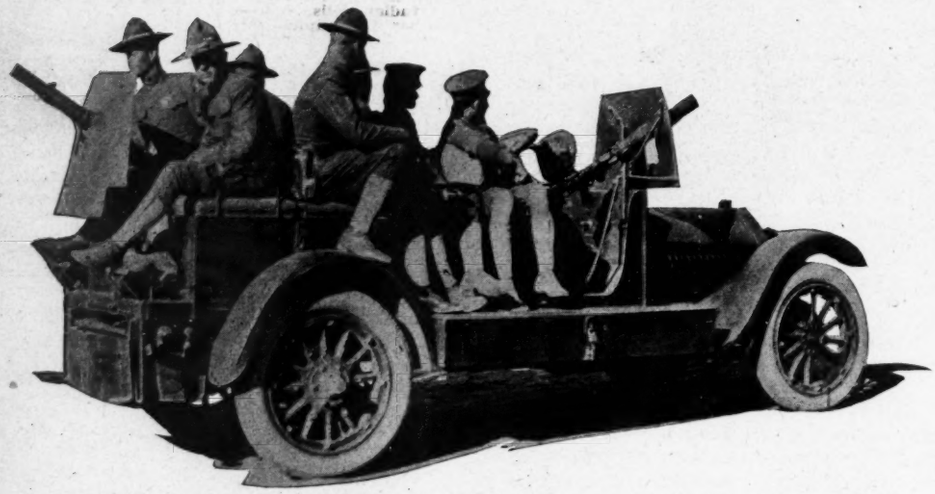
H. M. metal radiator cover divided into eight compartments operated as one



Friction stabilizer for Ford cars, the tension of which can be regulated to stabilize old as well as new models

Tozalone one-man tow bar which steers through a pivot attachment on the steering link and eliminates a helper

Among the Makers and Dealers



READY TO MEET THE GERMAN'S MOTORS—Just how soon the soldiers aboard this Studebaker machine gun car will see active service on some sector of the French front is highly problematical, but it is safe to assume that it will not be long. Besides its crew of eight men, each Studebaker machine gun car mounts two Lewis machine guns and carries 20,000 rounds of ammunition, tools, water, gas and oil, field rations and camp equipment—a total of 2½ tons. In short, the machine gun is primed to fight

THOMPSON Joints Royal Flying Corps—R. M. Thompson, formerly with the Schillo Motor Sales Co., Chicago, left Oct. 15 for Toronto, Can., to join the Royal Flying Corps.

Saxon Promotes E. M. Delling—E. M. Delling has been promoted to be chief of the inspection department of the Saxon Motor Co.

Mosta on Curtiss Engineering Staff—M. W. Mosta, formerly with the Continental Motor Co., has joined the engineering staff of the Curtiss Airplane Co.

Davey Now with Denby Truck—Charles E. Davey, former factory manager of the United States Motor Truck Co. of Cincinnati, has been appointed experimental engineer of the Denby Motor Truck Co.

Jones Becomes Federal Brass G. M.—Lloyd P. Jones, former sales manager of the Federal Brass Works, has been appointed vice-president and general manager of that company.

Campbell Foundry Adds to Plant—Two new additions are being rushed to completion on the Campbell Mfg. & Foundry Co., Muskegon, Mich., which will be used to care for increased production. The company is manufacturing radiator castings.

Harrow Tractor Starts Factory—The A. T. Harrow Tractor Co. will build a plant at St. Clair, Mich., for tractors. The first units will be used for assembly purposes only, to speed up the output. The factory will be expanded gradually, and the company will make its own parts later.

Daniels Concentrates on Dort Advertising—H. S. Daniels has become advertising manager of the Dort Motor Car Co. For some time Mr. Daniels has served jointly the Dort Motor Car Co. and the Dooley-Brennan Co. but has now severed his connections with the latter organization.

Little Chief Cadillac Research Engineer—T. J. Little, Jr., has been appointed research engineer of the Cadillac Motor Car Co. He will direct all research work, have charge of experimental laboratories and carbureter development, etc. For the last year Mr. Little has been directing special engineering investigation, and was formerly chief engineer of the Welsbach Co.

Winkelman a Liberty District Supervisor—B. F. Winkelman, formerly with the Chalmers agency in Philadelphia, has become district supervisor of the Liberty Motor Car Co.

Hamilton Joins Dayton-Wright—Harry Hamilton, assistant purchasing agent of the Dayton Engineering Laboratories Co., Dayton, Ohio, has become purchasing agent for the Dayton-Wright Airplane Co. He is succeeded at the Delco factory by Bert Hutchings, who in turn is succeeded by J. B. Shephard.

Yeats Resigns from Detroit—R. T. Yeats has resigned as director of sales and exports for the Detroit Motor Car Co. He has made no announcement of his future plans.

Booth to Manage Detroit Office—W. A. Booth of the Standard Steel Tube Co. has been appointed manager in charge of the Detroit office.

Jarmen to Manage Jackson Sales—Walter G. Jarmen has been appointed sales manager of the Jackson Automobile Co. Mr. Jarmen was formerly treasurer of the Canadian Briscoe Motor Co.

Park Resigns from Rust Proof—Wyman C. Parker, secretary, treasurer and general manager of the Parker Rust Proof Corp., has resigned. He will retain his stock interests and continue as director.

Stewart Acquires Factory Site—The Stewart Mfg. Co., maker of parts for motor cars, has acquired a 10-acre factory site in Chicago and will build a factory 300 by 300 ft. The company employs 700 men and has outgrown its present quarters.

Newton Leaves Willys-Overland—R. L. Newton, formerly district manager of the Willys-Overland, Inc., has resigned to become manager of the wholesale department of the Simons Sales Co., Overland distributor, Detroit.

Willys-Overland Promotes Morgan—George C. Morgan, formerly of the Toledo branch of the Willys-Overland Co., has been promoted to the general branch department at the factory. Morgan is succeeded by John Yoke, formerly assistant sales manager of the Smith Motor Truck Co.

Pioneer Motor Car Dealer Retires—Having started as a bicycle dealer, back in the nineties, the first in his home town to own a motor car and a pioneer in the sale of motor vehicles, entering the business in 1899, George Hance Patterson, dealer in Ford, Oakland and Chandler cars, Red Bank, N. J., has sold out his flourishing business and will retire.

Boone Is Consulting Engineer—John T. Boone, formerly chief engineer and factory manager of the Disco Electric Starter Corp., has opened an office as consulting and designing engineer. Gerald H. Allen, engineer and factory manager of the Detroit Starter Co., is associated with him but will not take an active part in the work, retaining his present position.

Ohio Electric Increases Workers—The Ohio Electric Car Co. has increased its factory workers to 200 and has a large amount of business on hand. About half the work is devoted to body manufacture, and the concern has 200 closed car and 100 roadster bodies in process of construction. Many of these are special taxis, roadsters and buses for Willys-Overland, Inc.

Chicago Dealers in Drive—A concerted drive to move used cars was made by Chicago dealers last week. They designated a section of the row as motor car center, and the dealers in this vicinity co-operated in advertising the sale. Cars were specially priced and sold on terms, each showroom remaining open until 10:30 at night. Among the dealers interested in the sale were: Dodge Brothers, Oakland, Stearns, Hudson,

Coming Motor Events

MEETINGS

Jan. 11-16—New York, National Association of Automobile Accessory Jobbers, convention.

SHOWS

Oct. 22-26—Syracuse, N. Y.
Oct. 22-29—Worcester, Mass.
Nov. 12-18—Denver, Col.
Nov. 12-19—Los Angeles, Cal.
Dec. 3-8—Akron, Ohio.
Jan. 5-12—New York.
Jan. 11-18—Washington, D. C.
Jan. 11-19—Providence, R. I.
Jan. 11-19—Philadelphia, Pa.
Jan. 18-24—Milwaukee, Wis.
Jan. 19-26—Montreal, Canada.
Jan. 21-26—Scranton, Pa.
Jan. 21-26—York, Pa.
Jan. 21-26—Portland, Ore.
Jan. 26-Feb. 2—Chicago.
Feb. 2-9—Minneapolis, Minn.
Feb. 9-16—Kansas City, Mo.
Feb. 11-16—St. Louis, Mo.
Feb. 18-23—Syracuse, N. Y.
Feb. 18-23—Grand Rapids, Mich.
Feb. 18-23—Springfield, Ohio.
Feb. 18-23—Des Moines, Iowa.
Feb. 18-25—Pittsfield, Mass.
Feb. 18-27—South Bethlehem, Pa.
Feb. 23-March 2—Omaha, Neb.
March 2-9—Boston, Mass.
March 20-23—Trenton, N. J.
April 9-13—Stockton, Cal.

Recent Incorporations

Battle Ground, Ind.—Johnson Brothers Co.; capital stock, $15,000; incorporators, Chester Johnson, E. W. Johnson and Frank M. Biddle.

Bedford, Ind.—National Exhibit Car Co.; capital stock, $10,000; incorporators, Bertha A. Edwards, Mary B. Murphy and V. P. Edwards.

Bucyrus, Ohio—Bucyrus Buick Co.; capital stock, $10,000; incorporators, Richard H. Lee, G. M. Gallagher, W. J. Patterson, L. R. De Groate and F. H. Crew.

Cincinnati, Ohio—Towle-Cadillac Co.; capital stock, $125,000; incorporators, Edgar Menderson, Leo S. Metz, W. Frank Glenn, M. C. Kennedy and W. C. Huxell.

Cincinnati, Ohio—Mason-Towle Co.; capital stock, $75,000; incorporators, Edgar Menderson, Leo S. Metz, W. Frank Glenn, M. C. Kennedy and W. C. Huxell.

Cleveland, Ohio—American Airplane Co.; capital stock, $10,000; incorporators, John Harris, Edward Everett, Wilbur C. Harris, Robb O. Bartholomew and Edward W. Leeper.

Cleveland, Ohio—Buckeye Accessories & Mfg. Co.; capital stock, $50,000; to manufacture accessories; incorporators, George W. Miller, Richard L. Sergeant, Patrick C. Lavey, Richard E. Murphy and Frank R. Peabody.

Cleveland, Ohio—Perfection Auto Robe Co.; capital stock, $5,000; incorporators, Joseph W. Lerner, Irving Silverman, Joseph D. Schenkel, M. M. Black and Edward S. Black.

Columbus, Ohio—Fairmount Tool & Forging Co.; capital stock, $100,000; incorporators, Albert H. Homans and H. O. Gibson.

Columbus, Ohio—Neil Garage; capital stock, $15,000; incorporators, H. M. Snyder, A. R. Martin, F. H. Watson, C. L. Beathard and Ben H. Harmon.

Columbiana, Ohio—Beard Tire Co., capital stock, $50,000; incorporators, Clement E. Beard, Calvin C. Helman, George Hupple, James J. Powers and Carl G. Schwertfeger.

Dayton, Ohio—Wagner Engineering Co.; capital stock, $40,000; incorporators, F. A. Wagner, F. G. Doty, M. C. Stern, F. W. Gruen and J. C. Grimm.

Detroit—Master Primer Co.; capital stock, $10,000; incorporators, E. T. Daniels, J. C. Cook and O. Stebbins, Jr.

Elkhart, Ind.—Standard Ignition Co.; capital stock $200,000; to manufacture magnetos, motor car parts and electrical devices; incorporators, Andrew H. Beardsley, Martin E. Crow, William H. Foster, John F. O. Stratton and Edward H. Zigley.

Indianapolis, Ind.—Premier Sales Co.; capital stock, $100,000; incorporators, Huston E. Davis, Edward E. Gates and Harold D. Johnson.

Indianapolis, Ind.—Rush Motor Sales Co.; capital stock, $25,000; incorporators, Fielden D. Gardner, Earl E. Davis and Harry G. Coleman.

Indianapolis, Ind.—National Accessories Co.; capital stock, $60,000; to manufacture machinery and accessories; incorporators, Joseph A. Martz, Elmer P. Warren and Will H. Remy.

Indianapolis, Ind.—Hampton-Campbell Inner Liner Co.; capital stock, $12,000; to manufacture tires; incorporators, William F. Hampton, Charles M. Campbell and Carl E. Wood.

Indianapolis, Ind.—Acme Convertible Body Co.; capital stock, $10,000; to manufacture convertible bodies for motor cars; incorporators, Joseph Butterworth, Edward Marosky, Henry Marosky and Richard A. Gahr.

Janesville, Wis.—Townsend Mfg. Co.; capital stock, $125,000; to manufacture tractors, farm implements, machinery, etc.; incorporators, R. C. Townsend, G. E. Townsend and R. B. Townsend.

Marion, Ind.—Grant County Auto Co.; capital stock, $10,000; to deal in motor cars and parts; incorporators, E. J. Hewlings, K. B. Hewlings and James A. Ross.

Toledo, Ohio—Square Deal Garage Co.; capital stock, $10,000; incorporators, Henry Stevens, Frank L. Milholland, Charles Hartman, Shoito M. Douglas and F. K. Denny.

Elgin, Maxwell, King, HAL, Overland, Marmon, Owen-Magnetic, Rauch & Lang, Detroit electric, Pierce-Arrow, Winton and Ford.

Blocker Now with Liberty—L. E. Blocker has joined the sales forces of the Liberty Motor Co. Mr. Blocker was formerly with Chalmers.

Houdaille Shock Absorbers on Cunningham—Houdaille shock absorbers will be standard equipment on Cunningham cars for 1918.

Reilly on Coast for Ajax—W. H. P. Reilly of the Ajax Rubber Co. has been appointed Pacific coast sales manager, with headquarters at San Francisco.

Star Motor Sells Its Plant—The Star Motor Co., Ann Arbor, Mich., has sold its plant to the Parker Mfg. Co. of Detroit, and the machinery is being transferred from Detroit as rapidly as possible.

Chevrolet Starts Plant Expansion—The Chevrolet Motor Co. will construct a new $100,000 factory building and a $30,000 addition. Additional permits call for a $15,000 addition.

Chalmers Promote H. W. Miller—Harry W. Miller, formerly service manager of the Chalmers Motor Co., has been promoted to be assistant sales manager and service supervisor.

Drysdale Goes to Cleveland Tractor—K. P. Drysdale, who for the last twelve years has been advertising manager of the Cadillac Motor Car Co., has resigned to become director of sales promotion for the Cleveland Tractor Co., Cleveland, Ohio.

Milburn Finishes Oldsmobile Bodies—The Milburn Wagon Works is doing the finishing work on all Oldsmobile closed cars and is turning out fifteen bodies a day. The chassis are shipped from Lansing to Toledo, where the bodies are added and completed.

Barnes Begins New Plant Construction—The Barnes Foundry & Mfg. Co. is starting construction of its new plant on the River Rouge, Detroit. The first unit of the plant will occupy a third of the property and represents an investment of $350,000.

Mitchell Fender Maker to Build—G. F. Mitchell & Sons Co., Cleveland, Ohio, manufacturer of motor car fenders, will purchase 6 acres for the immediate erection of a factory to cost approximately $100,000. This factory is to be of saw-toothed construction with six 50-ft. units, each 300 ft. long.

Jorgenson in Waupauca Plant—The Jorgenson Mfg. Co., Waupaca, Wis., has started operation in the plant of the Waupaca Felting Mills, which has been leased with the privilege of purchase. The company has been manufacturing accessories at Tustin, Wis., for some time, but is enlarging its activities. The following officers have been elected: President, J. P. Jorgenson; vice-president, Julius Jorgenson; secretary and treasurer, C. A. Jorgenson.

Burress an Inspector for U. S.—Paul D. Burress, former factory representative of the Maxwell Motor Co., is now serving the government as inspector at Kenosha, Wis.

Trombley Resigns from Premier—D. M. Trombley, district sales manager in the Northwest for the Premier Motor Corp., has resigned, but as yet has made no announcement of his future connection.

Haskins to United States Truck—E. A. Haskins has accepted a position with the United States Motor Truck Co. as assistant to the chief engineer and superintendent of service. Mr. Haskins was formerly factory manager of the Detroit Motor Truck Co. and before that service manager of the Federal Motor Truck Co. He will take up his new duties between Nov. 1 and 15.

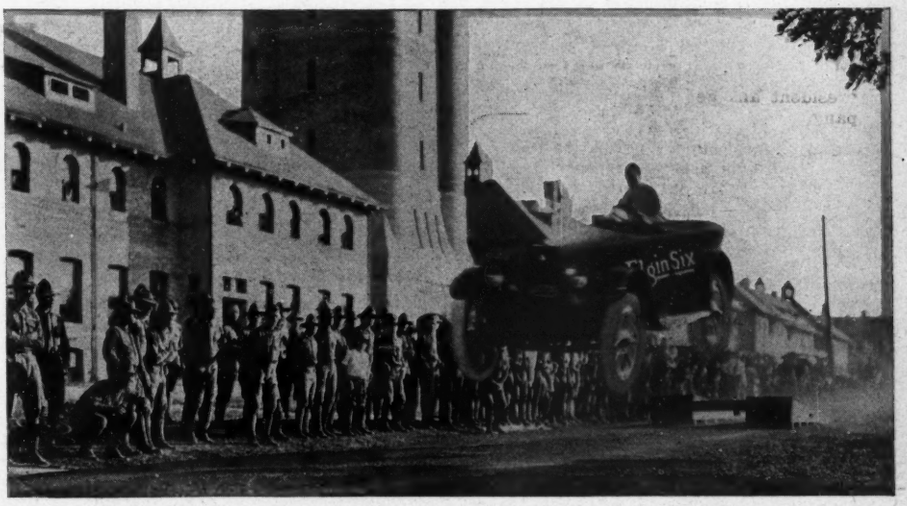
Sells Cars in Twelve Tongues—To handle retail sales with prospects not speaking English the Simons Sales Co., Overland distributor at Detroit, engaged I. Barr, who can speak twelve foreign languages fluently. This was considered necessary on account of the large foreign population in Detroit and the difficulty an English-speaking salesman had in closing a sale. Mr. Barr was born in Melbourne, Australia, of French parentage and has lived in various countries.

Johnson Now with Johnson Co.—C. F. Johnson, formerly carburetor engineer with the Cadillac Motor Car Co., has joined the Johnson Co., Detroit, in the same capacity.

French to Direct Monarch Sales—William S. French has been appointed director of sales for the Monarch Governor Corp. French formerly was advertising manager of the Denby Motor Truck Co.

Webber with Hood Service Bureau—W. K. Webber has been made general eastern traveling sales manager of the Wallace C. Hood Service Bureau. Mr. Webber was formerly sales manager of the Conley & McElroy Machinery & Engineering Co., Detroit.

To Make Juvenile Cyclecar—A small gasoline-driven cyclecar soon will be manufactured by the National Juvenile Auto Co., Toledo, Ohio. Low upkeep and operating costs are to be the feature of the new machine, and it is expected that a mileage of from 80 to 90 m.p.g. may be obtained. The following are officers: President, Dr. H. S. Kuebler; vice-president, K. C. Merrill; treasurer, J. G. Hickok; assistant treasurer, George Wideman; secretary, Robert L. Hands; and general manager, Charles F. Hamel.



ELGIN DOES BROAD JUMP FOR SOLDIERS—Before a large group of military experts an Elgin Six touring car proved its ability to jump army trenches at Fort Sheridan, Ill., recently, when it jumped 4½ ft. clear of the ground. To perform this feat the car approached the mark at a speed of more than 45 m.p.h., rising on a slight incline 18 in. high at the point of jumping off. It alighted safely at a point 60½ ft. distant. The car afterward was given a technical examination and was found to be uninjured, following which it carried five persons and baggage 33 miles back to Chicago

From the Four Winds

MISSOURI Licenses 144,465 Cars—In Missouri 144,465 motor cars have been licensed this year, together with 4097 motorcycles and 1341 dealers. The fees to date this year are $591,069, an increase of $169,337 for the same period last year. St. Louis has 27,279 of the total of cars. Kansas City has 16,649.

Jersey Loosens Up on Speed—Motor Vehicle Commissioner William L. Dill of New Jersey has ruled that after Nov. 1 every motorist convicted of driving a car in excess of 40 m.p.h. will be fined $25. As the limit of speed is 25 m.p.h., and the penalty provided by law is $100 fine or 10 days' imprisonment, this is regarded as a distinct loosening up on speed, even though the full penalty rarely has been imposed.

Shoe Dealer Fashions Motor Outfit—R. E. Orne, an Everett, Wash., shoe dealer, has evolved a motorists' camp box. Packed for traveling, the box occupies a space on the running board only 12 by 24 in. and weighs only 40 lb. Opened and ready for wayside use it becomes an outfit with the following features: A table 5 ft. long and 2 ft. wide, a collapsible stove, five camp stools, a food box 9 by 9 by 13 in. a frying pan, a coffee pot, two 1-qt. vacuum fruit jars.

Motor Cars Ruin Chicken Business—The constantly increasing numbers of motor cars in Southern New Jersey are playing havoc with chickens and are forcing many farmers who live along the much-traveled motor routes to give up the business of chicken-raising. With the high prices of all feeds, it does not pay to pen chickens up, the farmers say, and when they are allowed to range, they are slaughtered by the hundreds by motor vehicles.

Plans to Make Traffic Safer—The St. Louis, Mo., director of streets is drafting an ordinance by which he hopes to make traffic safer. He is consulting with the motor car associations and with the streetcar chiefs and the police. One feature is that all professional chauffeurs shall be examined and licensed. The object is that if this proves successful, the license shall be extended to all who drive cars. Revocation of licenses are to be a penalty for repeated offenses against traffic laws. An effort will be made to restrict the downtown parking, but it is not the intent to eliminate parking. A bureau will be established to examine service cars to insure reasonable safety of passengers.

SOMETHING new in the way of an outdoor display of motor cars was conducted successfully by the Bloomington Automobile Trade Association. Permission was given to display the cars on the sidewalk around the courthouse square, and eighty were thus shown. Space was divided among the twenty dealers, and was assigned by lot. The courthouse and business buildings of the vicinity were decorated with flags and bunting, a band gave concerts daily and many thousand persons viewed the show. Many persons were attracted who would not have paid admission to an indoor show, and the fall business, especially among closed cars, was given a noticeable impetus. Every dealer was enthusiastic over the results, the expense of putting on the show being very small, consisting largely of the band, printing and labor in moving the cars from the garage to the square and back. It is planned to repeat the show next fall on a somewhat larger scale.

This Camouflage Not Allowed—An ordinance has been passed in Tacoma, Wash., preventing "auto camouflage." It provides that every public garage must make a report to the police daily of cars left with them, including the identification numbers on the machines and full descriptions.

Truck Supplants Tramway Car—Far away in Leonora, West Australia, an old Garford truck is substituting most satisfactorily, it is said, for a tramway car. Leonora is about 5 miles from Gawlia, where the Sons of Gawlia mine is located. Formerly a tramway operated between the two towns, but one night fire destroyed the major part of the plant so the tram could not be run unless the plant was rebuilt. The city council, who owned the line, felt this not worth the price, but the miners who lived at Leonora and worked at Gawlia had to be transported. Accordingly, Gawlia bought the old Garford, had the mine people make wheels for it and a blacksmith build a body and leased the tramway line. The Garford has been named the Tank and is making profits for the company.

Motors Carry India's Mail—India made its first experiment last February with motor instead of horse vans to carry the mail to suboffices in Madrid. So successful was the experiment the entire horse service is to be abolished. The substitution resulted in a considerable saving. The cars also reduced the time of transit between the several offices.

Shorter Route to Jersey Resorts—Because of the frequent service provided by the Wilmington, Del.-Pennsgrove, N. J., ferry, motorists from the South and West, bound for New Jersey seashore resorts have found they can save about 30 miles to Atlantic City and neighboring resorts via the Pennsgrove-Malaga road instead of going through Philadelphia. The county authorities are preparing to pave this road, making an improved highway across the state from river to ocean.

Western Washington Clubs Unite—The Automobile Club of Western Washington has been organized by the consolidation of the clubs that heretofore have been in the principal cities of Western Washington. The work of marking the highways, opening suboffices and increasing the membership to 10,000 members will be started at once. The officers of the new association are: R. M. Dyer, president; D. D. A. Outcalt, vice-president; Frank Schultz, treasurer; I. C. Rowland, secretary.

May Regulate Camp Service Cars—Deming, N. M., where Camp Cody is located, is fast becoming a motoring center. More than 170 licensed service cars are operating between the camp and town, charging 25 cents a person for the trip. These cars average a net profit of about $20 for each owner. The report current in Deming at present is that the individual service car will be supplanted by a franchised line of motor buses duly bonded and operating under Government regulations, making the maximum charge 10 cents. This is contemplated to reduce the smuggling of liquors to the soldiers.